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ABSTRACT

A study was conducted to investigate parental belief systems and parental childrearing practices relative to the intellectual development of their communication-handicapped preschool children. Consideration was given to the context of family size and ordinal position of the communication-handicapped child. A total of 60 two-parent families with communication-handicapped preschoolers composed the experimental group; 60 families without communication-handicapped children participated as the control group. Three classes of assessment instruments were used to collect data from each family: (1) parent questionnaires and interviews, (2) child assessments and screening tests, and (3) observations of parent/child interactions. It was hypothesized that parental practices would be directly related to parents' beliefs about child development processes and about their own child's cognitive competence. In general, results provided only partial support for this hypothesis. (Related materials, including data tables and descriptions of the administration and coding of measurement instruments, are appended.) (MP)

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PARENTS AS TEACHERS OF THEIR OWN LEARNING DISABLED CHILDREN

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Abstract

The aim of this research was to investigate parental belief systems and parental childrearing practices, relative to the intellectual development of the communication handicapped (CH) preschool child, embedded within the context of family size and ordinal position of the CH child. An equal number of families with a non-handicaped (NCH) child served as a contrast group. The basic hypothesis underlying this research was that parental practices would be directly related to parents' beliefs about child development processes and about their own child's cognitive competence. These beliefs stem from at least two factors: First, experience as a child in a family; second, experience as a parent. The parent-child relationship in this setting was viewed as interactional, where each parent acted as teacher, socializer and manager of the child's behavior. In this role, the parent also learned both from the CH child and NCH child in the family. Therein lay the interest in investigating the impact of the parent-child relationship on parents and on CH children.

Specifically, the study addressed four problems: (1) the relationship between parental belief systems regarding children's cognitive capabilities in general and with respect to their own CH child in particular, (2) the effect of the CH child's level of functioning and position in the family constellation on parental belief systems, (3) the relationship between these perspectives and actual parental teaching and management strategies, and (4) the effect of such teaching/management behaviors on the CH child's level of cognitive functioning and level of representational competence. Each of these segments was identified and a path (causal) analysis model was developed from data collected with the following instruments: The Communication Strategy Interview, the Construction of the Child Interview, The Family Influences on Childrearing Interview (all of which were used to assess parental beliefs about developmental states and processes and to assess childrearing strategies and family practices); The Parent-Child Interaction Observation System [based on Sigel's (1979) distancing theory of representational competence, this was used to identify different types of parent-child interactions in structured teaching contexts and in semistructured story-telling task]; and a series of standard evaluation tests and nonverbal Piagetian tasks that focused on transformation, memory, sequencing and anticipation to evaluate children's level of cognitive functioning and representational abilities.

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Table of Contents

	Page
Abstract	i
Acknowledgements	ii
List of Tables	v
List of Figures	viii
Introduction	1
Review of Relevant Literature	2
Parental Influence on Children's Cognitive Development	2
Parental Belief Systems and the Family as a System of Mutual Influences	4
Impact of Family Constellation on Parental Beliefs and Children's Cognitive Development	10
Impact of Parental Teaching Strategies on Children's Representational Competence	14
Sample	16
Assessment Materials and Procedures	18
Parent Assessments	18
Child Assessments	23
Results and Discussion	28
Overview	28
Results and Discussion	29
Comparison of beliefs and communication strategies	29
Comparison of teaching strategies of parents	35
Parent behaviors as a function of task	39
Comparison of children's performance	42

Table of Contents (continued)

Page

Relationship between parental beliefs and distancing (teaching) strategies 44

Relationship between parental teaching strategies and children's competence 50

Relationship of children's competence to parental teaching strategies and beliefs 68

Relationship of children's verbal IQ to parental teaching strategies and beliefs 73

Relationship of birth order to parental beliefs, communication strategies and teaching strategies 75

Causal-model (path) analysis for parent-child mutual influences 82

Summary, Conclusions and Implications 88

Summary of Major Findings 88

Conclusions 89

Implications of Research for Practitioners 93

Final Word 95

References 96

Appendices

Appendix A: Administration and Coding Manuals

Appendix B: Tables of Means and Standard Deviations from WPPSI Verbal IQ Analyses and Birthorder Analyses

List of Tables

1. Descriptive Characteristics of Participant Families.
2. Means and Standard Deviations (S.D.) from Group Analyses on Construction Variables.
3. Means and S.D. from Group Analyses on Communication Variables.
4. Frequencies of Parents' Beliefs of Developmental Processes Comparing their own Child to Children in General.
5. Frequencies of Parents' Evaluations of own Child's Developmental Stage Compared to Children in General.
6. Correlations Between Parent Behaviors on Paper Task with Behaviors on Story Task.
7. Means and S.D. from Group Analyses on Parent Behavior Variables.
8. Significant Main and Interaction Effects from 2 x 2 x 2 (CH vs. NCH Group x Parent Sex x Task) MANCOVAs on Parent Behaviors.
9. Significant Main Effects from 2 x 2 [Group (CH vs. NCH) x Parent Sex] MANCOVAs on Parent Behaviors on the Paper Task or Story Task.
10. Significant Main Effects Obtained from a 2 x 2 [Group (CH vs. NCH) x Target Sex] MANCOVA on Cognitive Variables.
11. Results of $\underline{F}_{max}$ Test for Homogeneity of Variance in Cognitive Assessments.
12. Significant Correlations between Parental Beliefs and Parental Teaching Strategies on the Paper Task.
13. Significant Correlations between Parental Beliefs and Parental Teaching Strategies on the Story Task.
14. Correlations between Frequencies of Parental Teaching Strategies and Children's Scores on Cognitive Measures--NCH Group.
15. Correlations between Frequencies of Parental Teaching Strategies and Children's Scores on Cognitive Measures--CH Group.
16. Correlations of Arc-sine Transformations of Proportion of Errors on Teddy Task with Parental Teaching Strategies on Paper Task and Story Task--CH Group

List of Tables (cont'd)

17. Correlations of Arc-sine Transformations of Proportion of Errors on Teddy Task with Parental Teaching Strategies on Paper Task and Story Task--NCH Group.

18. Multiple Correlation Coefficients for Parental Paper-Folding Behaviors and Child Assessment Variables.

19. Multiple Correlation Coefficients for Parental Story-Telling Behaviors and Child Assessment Variables.

20. Results of F_{max} Test for Homogeneity of Variance in Parent Paper-Folding Behaviors.

21. Results of F_{max} Test for Homogeneity of Variance in Parent Story-Telling Behaviors.

22. Correlations Between Children's Competency on Paper Task with Children's Cognitive Scores.

23. Correlations Between Children's Competency on Paper Task with Parental Teaching Strategies.

24. Significant Main and Interaction IQ Group Effects Obtained from 2 x 2 x 2 MANCOVAs on Parent Behaviors (High Verbal IQ Group vs. Low Verbal IQ Group x Parent Sex x Task).

25. Significant Main IQ Group Effects Within each Task Obtained from 2 x 2 MANCOVAs on Parent Behaviors (High Verbal IQ Group vs. Low Verbal IQ Group x Parent Sex).

26. Significant Main IQ Group Effects Obtained from 2 x 2 MANCOVAs on Construction Variables (High Verbal IQ Group vs. Low Verbal IQ Group x Parent Sex).

27. Significant Main Birthorder Effects Obtained from 2 x 2 x 2 MANCOVAs on Communication Strategy Variables (First-born vs. Later-born x CH Group vs. NCH Group x Parent Sex).

28. Significant Main and Interaction Birthorder Effects Obtained from 2 x 2 x 2 x 2 (Birthorder x Group x Parent Sex x Task) MANCOVAs on Parent Behaviors.

29. Significant Main and Interaction Birthorder Effects Obtained from 2 x 2 x 2 (Birthorder x Group x Parent Sex) MANCOVA's on Parent Behaviors on Paper Task.

30. Means and S.D. from IQ Analyses on Communication Variables.

List of Tables (cont'd)

31. Means and S.D. from IQ Analyses on Construction Variables.

32. Means and S.D. from IQ Analyses on Parent Behavior Variables.

33. Means and S.D. from Birthorder Analyses on Communication Variables.

34. Means and S.D. from Birthorder Analyses on Construction Variables.

35. Means and S.D. from Birthorder Analyses on Parent Behavior Variables.

36. Means and S.D. from Birthorder Analyses on Cognitive Variables.

List of Figures

1. Proposed Model of Mutual Parent-Child Influences.

2. Path Analysis of Parent-Child Mutual Influences within Families of CH Children.

3. Path Analysis of Parent-Child Mutual Influences within Families of NCH Children.

Introduction

Parents exert a major influence in the course of children's cognitive development, both for normally developing children and for children with specific communication handicaps. Further, particular parental childrearing strategies derive from belief systems which the parent has constructed on the basis of his/her own childhood experiences, as well as on the basis of experience as a parent of CH and normally developing children. Such belief systems should not be confused with attitudes and values. Rather, a belief system, as we define it, is conceived as a dynamic organization of psychologically consistent (as opposed to logically consistent) constructs central to the individual's world view. Such systems provide a framework for assimilating new information or knowledge.

Since experience with one's own child(ren) influences the construction of a belief system, the number, sex and ordinal position of children are of potential significance. Having a communication handicapped child is in itself an important factor influencing parents' views of children as well as of self. The situation for the parent is quite different when the CH child is one among other NCH children. Ordinal position of the child is no doubt also relevant. Parents of an only child who evidences a specific communication handicap are likely to have different beliefs concerning child development and their own child's progress than parents of a CH child who is first-born or second-born in a multiple child family with NCH siblings. Such differences that occur with family constellations could affect the CH child, since specific teaching and management strategies generated by such belief systems could have differential effects on the child's level of cognitive functioning. For these reasons, we included family size and birth order as factors to be investigated.

The research project had a number of interrelated objectives.

The first aim was to explore the parent's conceptualization of child development in general and of his/her own child's capabilities in particular. We shall refer to this conceptualization as a belief system. Families that do and that do not have a child with a communication handicap were included. It was expected that parents of a child with a communication handicap posit different conceptualizations of development and that these differences would be influenced by having had a CH child.

A second, subordinate objective pertaining to parental beliefs was to examine the relation between mothers' and fathers' beliefs, and the effect of the ordinal position of the CH child in the family constellation on parents' belief systems.

The third aim was to explore the relation between parental belief systems and parental teaching and managerial behaviors with their CH and NCH children. Previous research conducted by the authors indicates that a relationship between beliefs and particular parental practices exists for parents of NCH children (Sigel, McGillicuddy-DeLisi, & Johnson, 1980). We hypothesized that differences in the behavior of parents of CH and NCH

children (cf. Doleys, Cartelli, & Doster, 1976) may be due in large part to differences in parental beliefs that are generated by their experience with the CH child. Investigation of parental strategies included sensitivity to the child's understanding and modification of strategies relative to the child's apparent competency levels.

The fourth objective was to obtain an independent evaluation of the child's level of development to test the relation between parental beliefs, parental practices and the child's level of performance on a series of standard assessments and non-verbal Piagetian tasks. Measures of the child's intellectual functioning were obtained from the WPPSI (tests of intelligence) and from nonverbal tasks that assess what Piaget has termed level of operatory development. Using these data the performance of children with a communication handicap could be compared for traditional tests of intelligence and for tests that do not assume linguistic competence either in instructions, stimuli or response modes.

The following sections will focus on four background areas that relate to our conceptualization of the mutual influence of parents and children. First, the significance of the parental role in the cognitive development of children will be discussed. Second, parental belief systems and a model of the family as a system of mutual disorder influence will be presented with particular reference to the child evidencing a communication handicap. Third, the impact of family constellation (family size and ordinal position of the target child) will be discussed in relation to parental beliefs and child outcomes. Fourth, the development of representational competence will be discussed in relation to parental practices and particular relevance to communication handicaps in children. Childrearing practices will be discussed in relation to distancy theory (Sigel, 1979), a theory identifying the significance of particular types of verbal parent-child interactions for children's cognitive development.

Review of Some Relevant Literature

Parental Influence on Children's Cognitive Development

Investigations of the role of the family experience in children's cognitive development indicate that parental childrearing practices and parental attitudes or values are related to children's performance on tests of cognitive ability. In an early study, Moss and Kagan (1958) found that maternal concern with achievement, measured by mother-child observations, was related to children's IQ scores. Maternal attitudes (Hurley, 1959), parental values (Norman, 1966) and parental interest in the child and education (Rolcik, 1965) have similarly been found to be related to children's intelligence or scholastic achievement.

In a review of the literature of parental influence on cognitive development during early childhood, Freeberg and Payne (1967) report that certain aspects of the parent-child interaction influence levels and areas of children's cognitive development. These authors report mounting evidence for the importance of the home environment in various aspects of children's development. In 1963, Bing presented data indicating a relationship between maternal verbal stimulation, memory for the child's early accomplishments, criticism of poor academic achievement and the child's level of verbal ability. The results of Jones (1972) provide further support for the relationship between parental practice and children's verbal abilities. Data obtained from interviews of mothers of high- and low-verbal boys (identified by WISC subscale scores) indicate that mothers of high-verbal boys tended to encourage verbal interactions and had higher academic aspirations for their children than mothers of low-verbal boys. Relationships between maternal nurturance and IQ scores have also been reported (Bayley & Schaefer, 1964; Radin, 1974). These studies indicate that maternal practice may have a potent impact on children's verbal abilities and the development of other cognitive skills assessed under the rubric of IQ.

Mother-child communications have also been related to cognitive growth over and above socioeconomic class membership. In an investigation of four different social status levels, Hess and Shipman (1965) found that maternal teaching styles that varied with respect to control systems and range of alternatives seem to mediate social class differences in children's learning styles and information processing strategies. Brophy (1970) has also presented data that differentiated mothers from different social classes in terms of repertoire of techniques, types of verbal instruction and information specificity. Thus, behavior patterns and processes in the home environment may transcend status variables in determining sources of individual variation in intellectual growth.

Although these studies indicating the impact of parental attitudes and practices on children's cognitive abilities have been conducted on normally developing children, it is possible that such a dynamic may also be obtained for children with a specific learning disability such as a communication handicap. Observations of parent-child interactions indicate that parents of children with a learning disability may teach and manage their children differently than parents of normally developing children (Campbell, 1972; Doleys, Cartelli, & Doster, 1976; Wilson, 1975). This is hardly surprising since parents of a child with a learning disability may have different ideas about their role as a teacher, different tolerance levels or attitudes toward academic behavior, etc. (Freeman, 1971; Wetter, 1972). These differences in parental behavior and attitudes may have a marked effect on the communication handicapped child's progress. McWhirter (1972), for example, found positive behavioral changes in children whose parents participated in a program that included behavior modification techniques, child development courses and group counseling. Edgerly (1975) concluded that successful treatment programs for learning disabled children must include parents on the basis of differential measures in children's achievement when parents were or were not involved in tutoring and counseling groups. Grilli (1974) also found that participation in parental discussion groups co-led by a counselor and a learning

disabilities specialist was related to positive changes in children's scores on the Devereux Elementary School Behavior Rating Scale and the Missouri Children's Picture Series.

The quality of parent-child interactions has gained emphasis, especially where learning disabled children are concerned (Beckwith, 1974; Denenberg & Thoman, 1974). No doubt this is in part due to findings that intervention programs with disadvantaged and other children often fail due to a lack of parental involvement in a manner that influences childrearing practices (cf. Starr, 1971). At any rate, home-based programs with the handicapped seem to be more successful in effecting cognitive gains than traditional instruction programs used with simila underprivileged children (Shearer & Shearer, 1972).

Collectively, these studies support the basic proposition of this research that the family system in its varying functions does influence the quality and rate of cognitive growth. The particular issue, however, addressed in this study, was the identification of family factors that influence cognitive development among communication handicapped children.

We expected that parents of communication handicapped (CH) children would differ from parents of normally developing children in the types of preferred teaching and management strategies, and that these strategies would affect the CH child's level of cognitive functioning. The strategies of parents with a CH child may not be optimal given the CH condition, and in fact, may compound their child's difficulties by not providing an environment which is intellectually challenging. Parents' childrearing strategies are not to be construed as a cause of the child's disability, but rather, parental styles of interaction are affected by feedback from the child's behavior. That is, the content of the feedback from the CH child differs from that generated by a NCH child and parental responses in the form of teaching/management strategies may not be optimal for the potential intellectual development of the CH child.

In subsequent sections, we describe parental communication strategies with CH children and NCH children and examine the relationships in parental beliefs about child development states/processes and optimal childrearing techniques for the CH child. We hypothesize that parents of a child with a communication handicap will have constructed a system of beliefs that differs from beliefs constructed by parents of a NCH child. Parents in the CH group have had broader and perhaps contradictory experiences with both CH and NCH children, forming the content of their constructions. Within such a framework, the feedback network between child and parent is of tantamount importance for providing an environment that allows the CH child to fulfill his/her intellectual potential.

Parental Belief Systems and the Family as a System of Mutual Influence: The Theoretical Perspective

A basic premise of this research was that parent belief systems (constructs) about children in general, and about the communication handicapped child in particular, contributed significantly to parental teaching and managerial strategies. This premise is derived in part from the work of George Kelly who has created

a system known as Constructive Alternativism (1955, 1963), and in part from our own work into family influence, under a grant from the Office of Population Research (Sigel, McGillicuddy-DeLisi, & Johnson, 1980). Kelly proposes that each individual formulates his own constructs and views the world through these constructs. We propose that parents' beliefs about children are used to categorize events and guide the parent's own behavior with respect to the child's progress and behavior just as Kelly's personal constructs are seen as the directing source of behaviors in interacting with any other person. Thus, the parent's construction of the communication handicapped child and of children in general are taken to be a source of parental childrearing practices, and of parental childrearing goals with regard to their own communication handicapped child.

A principle assumption within such a framework is that the active organism does not passively assimilate information and construct a belief system. Rather, the human builds from experience and systematizes the grouping of constructs so as to minimize psychological inconsistencies between these cognitive elements. Humans are thereby free in the sense that they construct their environments and are determined in the sense that their constructions guide subsequent actions. As Kelly (1958) says:

> This personal construct system provides (man) with both freedom of decisions and limitations of action. Freedom because it permits him to deal with the meaning of events rather than forces him to be helplessly pushed about by them, and limitations because he can never make choices outside the world of alternatives he has erected for himself (p. 58).

Constructs of social and physical reality can serve to maintain a coherent perspective of the world. However, since individuals live in an environment which produces both confirmation and disconfirmation of existing systems, each individual is continually faced with a challenge to these world views. Inherent in this experience are the seeds of change. Change, however, does not come about just by our exposure to that world, but rather by the quality of our engagement in that world and the nature of previously evolved constructions. While on the one hand, our experiences may confirm our constructions regardless of the particular content of that experience, they also have the potential, at least, for disconfirmation. When this occurs, the entire system of beliefs (constructs) may be altered in order to accommodate new or discrepant constructs that have evolved on the basis of our experiences.

The history of psychology has been replete with concepts dealing with determinants of behavior. Motivational systems, belief systems, and attitudinal systems among others, have been offered as sources of overt behavior. A discussion of the various battlegrounds regarding the "best" or the "most relevant" perspectives is not warranted at this point. However, each of these types of constructs emanate from different theoretical positions, e.g., Murray's need system (Freudian), belief systems (Heider, 1958), attitudinal systems (Allport's ego-psychology), personal constructs (Kelly, 1955), attribution theory (Kelley, 1972). Whichever theoretical system is elected, which is in part a function of the

predilection of the investigator rather than the validity of the system (each system has proffered data supporting the perspective), there seems to be no doubt that it is reasonable to offer a set of hypothetical constructs which serve as mediators between core inner states and response systems. Our position is that the mediators that are salient for us in understanding family dynamics, especially of the role of parents as family members who are in a powerful position to define family environments, are belief systems of parents.

A belief system is in effect a cognitive map by which reality is defined. On the basis of this reality, the individual partitions reality, attending to those features which are predefined by the cognitive organization as salient and relevant to this core system. In effect, Kelly's (1955) personal construct system postulates that "a person's processes are psychologically channelized by the ways in which he anticipates events" (p. 46). Kelly's basic unit of analysis, the personal construct, is defined as a template or representational schema which a person construes on the basis of his/her experience and then uses it to guide his/her reality. It is assumed that each individual employs his personal constructs both to forecast events and to assess the accuracy of his previous forecasts after the events have occurred, thereby testing his constructs in terms of their predictive efficiency. In short, a person anticipates events by constructing their replications (construction corollary). As events subject a person's anticipation to a validational process, confirming some of them and disconfirming others, his constructs undergo progressive changes as a function of assimilation of those beliefs to the existing system.

A belief system is not in our conception an attitude nor an attribution system. It is not an attitude since it is not limited to a single object nor is it defined as a predisposition to act (a classical definition of attitude). A belief system does have some aspects in common with attribution, but they are not identical, since attribution tends to emphasize inferences of cause-effect and "deals with the rules the average individual uses in attempting to infer the causes of observed behavior" (Kelley, 1972, p. 42).

In our view, inferring causes of another's behavior is but one set of mediators that influence behavior. Attributions may be seen as dependent on a belief system which is defined as an organization of constructs of the social, physical and interpersonal environment. Similarly, attitudes or values are applications of a belief system to a particular class of events or singular outcome. Belief systems, or constructions, are viewed as more complex and systematized bases for behavior and are closely tied to cognitive processes rather than affective or personality factors.

The importance of parental belief systems and conceptualization about the child in relation to parental practices and intervention programs seems obvious. What the parent believes about the cognitive capabilities of the CH child and the normally developing child is likely to be a major influence on parental practices. Furthermore, parental beliefs about the cognitive growth of the child cannot be construed in isolation; rather, beliefs about the child can be related to parents' experience with CH and NCH children and to the cognitive capabilities of the individual child.

Empirical research that has attempted to relate parental conceptual systems in general to childrearing practices has been scant. There is some indication, however, that parents do evolve certain styles that may be related to belief systems, and that these elements are related to particular parental behaviors. For example, Weigerink and Weikart (1967) and Hess and Shipman (1965) provide data indicating a relation between parental cognitive styles and parental teaching strategies. Less effective teachers are described as having a more descriptive-concrete cognitive style. Bishop and Chace (1971) reported that parents' level of conceptual development, determined by Harvey's (1966) This-I-Believe-Test, was related to parental structuring of the home play environment. Mothers classified as concrete tended to provide more restrictive play environments and indicate more inflexibility, control and discouragement of the child's exploration than mothers who were classified as more abstract in conceptual development. Such findings indicate the value of augmenting descriptions of parents with information about the nature or extent of parents' cognizing about their children.

Parental beliefs about child development in general and about their own child's capabilities in particular have not been investigated per se. However, some studies do suggest that parental awareness of the child's cognitive processes and growth is related to the child's cognitive performance. For example, Bing (1963) found that children's verbal scores were related to mothers' memory of the child's early accomplishments, among other things. Wolf (1964) in a study of environmental process variables related to intelligence, found that the amount of information mothers had about the child's intellectual development was predictive of the child's score on IQ tests. These findings indicate that parental knowledge of their child's development is related to enhanced performance on cognitive assessments by the child.

Although numerous studies have investigated parental attitudes toward a learning disabled, physically handicapped or mentally retarded child, such investigations have tended to focus on acceptance/rejection patterns and perceived discrepancies between special/normal/ideal children (cf. Worchel & Worchel, 1961), perception of the child's adjustment (cf. Wetter, 1972), overindulgence (cf. Wilson, 1975), authoritarian control (Freeman, 1970), and overprotectiveness (cf. Abrams, 1970). Few researchers have investigated parental beliefs about the child's cognitive status. A great deal of additional research is needed in this area. For example, many questions about the parent's understanding of the child's intellectual abilities, and the relationship of such understanding to parental behavior and the development of the CH child remain unanswered.

A nonrecursive[1] model of the family: This formulation of adult cognitive organization, emerging through the course of interactions with objects, people and events, leads directly to a nonrecursive path model of family influence. Since parental belief systems are subject to modification as a result of new or discrepant experiences, the behavior and abilities of each child in the family have potential impact on these beliefs as the child behaviors are incorporated in the existing parental belief system. When this occurs, parental behaviors may alter so as to be consistent with these changes in beliefs. As parental practices change, so would their impact on the child, and additional feedback from each child in the family must be dealt with in the context of the belief system continuously being constructed by the parent. Thus, within the limited environment of the home, parent affects child and child affects parent (see Figure 1). Similar dynamics also occur between the two parents and interact with each child in the family. Such a model clearly implicates family structure variables such as number of children and ordinal position of the target child, as well. The impact of these variables on the family as a system will be discussed in a later section.

Such an approach to family development is hardly new and an excellent presentation of this perspective is provided by Hill (1973). Conceptualizations of families as systems in which individuals in the family unit function in relation to one another have, however, been applied most often by family therapists (cf. Bowen, 1972, 1974; Haley, 1964) and are seldom subjected to empirical verification with families of a CH child. In a later section we will contend that a causal statement about these mutual influences within the family is possible through path analysis.

While the previous research on parent-child relationships has tended to focus on the impact of either of the parents on the child, there has been a dearth of studies taking the family as a unit. Our contention is that focus on only one of the parents tends to fragment the experiential bases of the child. Rather, the father, the mother and the siblings all have a role to play in impacting the target child in our investigation. Useful then as the previous research may have been in highlighting the significance of the particular parent, such research is obviously limited to explanations of the patterns and processes in the home environment. Data purporting to attest to the effect of the parent on the child when limited to one of the parents can only provide a partial answer to the significance of parental practices. And it is possible that descriptions of the significance of the relationship are erroneous unless the larger familial environment is taken into account. Is it not possible that behaviors of the fathers or the mothers alone may mitigate or exacerbate the influence of the other parent? Further, what is the impact of siblings, not only on the target subject, but also on the parent relative to the target subject? In other words, the family is a functioning system in which it is reasonable to assume that each family member influences every other family member. To date relatively little research has focused on the family as a system in which one of the family members, in this case a child, is deviant from the family norm or parental expectations. A notable exception is the early work of Farber (1960) and Farber and Jenné (1963) with families of mentally retarded children. His approach tends to lend support to our contention that the family must be viewed as a system if we are to gain understanding of the role of familial experience on the development of the child. A CH child can be considered "deviant" from the other family members in that his/her behaviors and capabilities are usually widely divergent from other

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[1]It should be noted that the mathematical definition of "nonrecursive" differs from the usual meaning of the term.

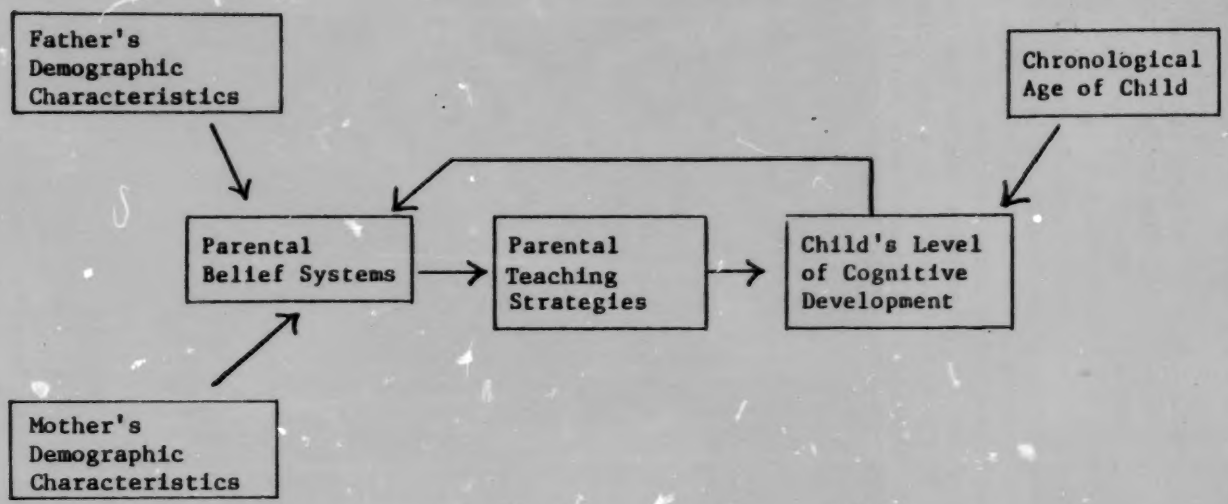


Figure 1. Proposed Model of Mutual Parent-Child Influences.

family members and the child is viewed as creating a crisis, where "a family crisis is defined as the breakdown of patterns of conduct and values which had been developed to guide activities of family members through the family life cycle" (Farber, 1960, p. 5). In sum, if we accept the assumption that familial experience as expressed by the interactions of family members provides a major socialization experience impacting among other features the cognitive functioning of the child, then it is incombent on behavioral research to focus on the family as the unit of analysis instead of each of the family members in isolation from other family members.

It is because of this orientation that we elected to study the family as a system of mutual influences in order to evaluate social factors influencing the development of children with language disorders. This study should provide information regarding the way parental influences are transmitted as well as changed. Research focusing on the mutual influences of members of a family unit must, however, include consideration of family variables such as size and ordinal position. Prior investigations indicate that such variables are relevant in terms of the intellectual attainments of the children within families. The interaction of these variables when one of the family members evidences a specific learning handicap, however, is a neglected area of study. Past relevant research relating population characteristics to the child's cognitive development will be presented in the following section, and some implications regarding the child in the family system will be discussed.

Impact of Family Constellation on Parental Beliefs and Children's Cognitive Development

A survey of the research literature on the family and the intellectual development of learning disabled children and normally developing children reveals that most of the research has related to parental adjustment or to the impact of family size or ordinal position on children's cognitive functioning. However, most of this research has emphasized academic achievement or IQ, while neglecting the class of parent-child interactional variables which help account for differential child outcomes. Furthermore, although most programs for children with communication handicaps include a parent counselling or education group, the effects of the family and the child's position in the family constellation have not been incorporated into most empirical studies or applied programs.

Past research relevant to the effect of family structure on children's intellectual functioning will be presented separately for family size and for birth order effects. Since there is a dearth of information regarding the effect of the position of the communication handicapped child in the family on either parents or children, some speculations concerning the interaction of these factors will be offered.

Family size: The relation of family size to intelligence has interested researchers for many years. Family size has been found to be negatively related to intellectual achievement in a number of studies (Anastasi, 1956; Dandes & Dow, 1969; Lentz, 1927; Marjoribanks, Walberg, & Bargen, 1975; Nisbet, 1953; Schooler, 1972a; Wray, 1971). In these studies, children from large families tended to perform more poorly on indices of intelligence, verbal ability or academic achievement. An inverse relationship between family size and intelligence has been reported even with the effects of social class adjusted (Douglas, 1964; Nisbet & Entwistle, 1966) although there is some indication that the effect is attenuated in upper income groups (Anastasi, 1959; Belmont & Marolla, 1973; Kennet & Cropley, 1970; Marjoribanks et al., 1975).

A confluence model was proposed by Zajonc and Markus (1975) to explain the relation of family size and birth order to intelligence. In this model, the intellectual value of a newborn is near zero and the intellectual environment provided is the average of the intellectual levels of the other members in the family. That is, each additional child "dilutes" the intellectual environment of the home to a degree, depending on spacing between children. Such a model has great significance for the family including a communication handicapped child, since all children are affected by absolute intellectual levels of each member.

The general findings concerning family size and intelligence would lead one to expect that only children, regardless of whether a communication handicap condition exists or not, would have the greatest advantage. This typically has not been found (Breland, 1974; Damrin, 1949; Maller, 1931; Schachter, 1963). Zajonc and Markus state that only children are at a disadvantage in the same way as last borns are, in that there is not a younger child in the home to teach.

Other investigators have focused on differential childrearing or parent-child interactions to evaluate the consequences of family size on child development (Bossard, 1953; Bossard & Boll, 1956; Cicerelli, 1976; Elder & Bowerman, 1963; Marjoribanks & Walberg, 1975). The data presented by Marjoribanks and Walberg indicate that variance in amount of parent-child interaction with size of family and socioeconomic level can account for findings in the literature that relate to social status, family constellation and children's cognitive performances. Thus, there is some evidence that variation in intelligence with status or population characteristics could be due to differential patterns and processes in the home environment.

Ordinal position: Reviews of the literature on birth order effects have concluded that this area of study is beset with equivocal findings (Adams, 1972; Hare & Price, 1969; Price & Hare, 1969; Schacter, 1963; Schooler, 1972b). A number of studies report that second-borns do better on intelligence tests than first-borns (Koch, 1954; Thurstone & Jenkins, 1929; Willis, 1924), or there are no significant differences in intelligence with birth order (Schoonover, 1959). On the other hand, some studies show the opposite results.

For example, Altus (1966) presents data indicating that in select samples, first-borns achieve higher intelligence scores and perform particularly well on verbal tests. Chittenden, Foan, Zweil and Smith (1968) report that first-borns excel later-borns within different ranges of abilities. A weak birth order effect favoring first-borns was also reported by Eysenck and Cookson (1970) for measures of verbal ability.

In addition to an effect for family size, Belmont and Marolla (1973) also report significant effects for birth order within a given family size. Children who performed well came from smaller families and within a given family size the brightest were born earliest. This finding was independent of social class, with the exception of farm families. The confluence model of Zajonc and Markus, which was tested on the Belmont and Marolla data, proposes that younger children in a family with small spacing between siblings are at a decided disadvantage since the contribution of each child to the intellectual environment is likely to be relatively low. Davis, Cahan and Bashi (1976) present data indicating that achievement decreases as a function of birth order in small families for Israeli eighth grade children.

As was the case with family size effects, there are some findings that indicated that family interaction systems may account for variability in intelligence with birth order. That is, investigations of childrearing practices indicate that types of parent-child interactions vary with first- versus later-born children (Cicerelli, 1976; Hilton, 1967).

In summary, the research shows that family structure variables such as number of children and ordinal position are relevant in terms of parent input-child outcomes relations is a neglected area of study. Moreover, the need exists to examine intellectual growth in process, and not simply as a final product. More intensive treatment of the influence of the family on cognitive development is called for.

The evidence that family size and ordinal position collectively impact cognitive growth in children is convincing. Those studies which have examined such familial relationships vis-a-vis children have primarily focused on normal children. To be sure, while the addition of each child to a family constellation does alter the nature of family functioning, arrival of each normal child still allows "the parents...to maintain most of their occupational, friendships and kinship commitment" (Farber, 1960, p. 5). However, when a CH child enters the family, we would expect considerable parental distress and concern as to how to cope with this new and unexpected stressful situation. Many perplexing questions arise for parents, ranging from "How come?" to "What to do?" Frequently the need for guidance as to how to care for the child, what the prognosis is, and how to find and to evaluate proper services for care and/or remediation becomes paramount. Preoccupation with the care of the deviant child may alter a variety of previously established or anticipated procedures for childrearing practice. Attention may be withdrawn, albeit unwittingly, from the normal child because of the demands necessitated by a child who has difficulty communicating his/her needs and wants. On the other hand, the communication handicapped child may be rejected because of his deviancy, especially if it conflicts with parental expectations.

These are the classic positions and are reasonable possibilities. The question is why the over-commitment or the under-commitment? Among the reasons may well be the parents' beliefs regarding the future of this child. Conceivably some parents believe that with proper education and home training the child will actualize his potential, and so every effort made in that direction is valued. We refer to parents of this persuasion as recognize-optimistic, as the parents are hopeful as to future child outcomes, but they still are aware of the nature of the disability limitations. Or parents may recognize the fact that retardation exists, and believe that little can be done to remediate this problem. This persuasion is referred to as recognize-pessimistic. (We are not making a value judgment regarding the reality of the parent's belief.) A third group of parents may be termed denial-optimistic. Such parents may not recognize the child's difficulty as anything but a <u>delayed</u> developmental problem and believe that the child will outgrow the CH condition. There is a fourth persuasion, those parents who exaggerate the limitations of the CH condition and believe that the child's prognosis is hopeless. This persuasion we refer to as denial-pessimistic. Thus, parents may recognize the CH condition, i.e., be "in tune" with the child's capabilities, or they may overestimate or underestimate their child's developmental capacities. Within each of these groups, the parents could have either an optimistic or a pessimistic view of future outcomes for the child.

The belief system, we argue, is a critical moderating constellation of factors influencing how the parents behave, the urgency with which they seek professional help, and how they integrate the child into the family.

The belief system may be differentiated relative to the sex, ordinal position and spacing of the child. Unless parents are truly unbiased in their hopes and plans for their male and female children, there may well be differences in how the parents will respond if the child involved is a boy or a girl, or whether it is an only child, first-born or later-born child in the family constellation. Farber describes how older sisters were often expected to function as surrogate caretaker for the young retarded child (Farber & Jenne, 1963). Whether this is still true 15 years later is an open question. Further, the belief that males are to be the breadwinner and fulfill the traditional male role may well be a critical feature in influencing how a parent responds to the child with a language disorder. Where maleness is viewed traditionally, it might be expected that different plans, expectations and acceptance of the child's difficulty would arise for male versus female children.

Since we believe that belief systems are directly related to practice, we would expect that particular beliefs organized around CH children might serve a similar function. A critical feature for the parents is the degree to which the parents believe that with proper guidance and education the child's condition will be remediated and, at the extremes, the parents' belief that the child will or will not live a normal life. We planned to explore this question in some detail because we thought that it might be a critical feature affecting other types of beliefs.

Such parental beliefs may well be mitigated by the ordinal position of the child with the language disorder. If it is a first-born or an only child and the parent has had little experience with children, then the parent may be less aware of what to expect and, not recognizing certain sysmptoms as problems, construct beliefs concerning normal development on the basis of such information. Yet, on the other hand, the parent may be disappointed and reject the first child who is not normal. This may well produce a family crisis as defined by Farber (1960). Having a CH child as the first born provides a different experiential base (versus having a later-born CH child with older normal siblings), which would have differential effects on parental beliefs and practices for subsequent children.

There are again a number of possibilities for different reactions to the CH child as a function of that child's ordinal position. If the first-born evidences a CH condition and the second child does not, the second child may be "prized" because of his/her intactness. Or parents' experiences with the first CH child may be a source of developmental landmarks for the parent, leading to over-reaction to the achievements of their second, NCH child. It is also conceivable, however, that parents may be intent on fostering the development of the CH child and believe that this child needs special help and attention, while the NCH child can fend for her/himself. In the case of a second-born child who evidences a communication handicap, the usual dethronement of the first-born may be more dramatic if parents take this approach. This may be due to the added demands and services required by the CH child. (In this sense, there can also be economic demands, e.g., private schools, etc.)

In sum, entry of a CH child into a family upsets the equilibrium (if other children are already there). Parents' expectations are affected and different patterns are set in play for later births in the case of a first-born CH child. How the parents react and cope with this event can be of momentous impact on how the CH child will develop.

The child's educational and social success in coping with the disability will depend to a large degree on what attitudes and feelings he/she brings along into the educational setting. Familial experiences may provide a good predictor of effects of any educational experience. The class of familial experiences of moment now are those teaching/management strategies stemming from parental belief systems and expectations regarding the child's prognosis and finally the degree to which the parents' belief systems and their subsequent derived practices facilitate cognitive development.

Impact of Parental Teaching Strategies on Children's Representational Competence

When a child develops to a certain cognitive level, he becomes capable of representing what he knows in a variety of ways--through gestures, images or language, for example. Signs and symbols can then be used not only to represent events, objects or people for himself, but are also available to the child for use in communication and in the service of problem solving. It is the ontogenesis of this class of competencies, i.e., representational abilities that are of interest in this study.

Where concern with intellectual growth has been an issue, outcome evaluation tends to emphasize IQ scores or verbal abilities. The basic cognitive processes that are the substrata for intellectual functioning measured as IQ typically have been ignored in studies of individual variation in intelligence. This emphasis on IQ and verbal abilities precludes an understanding of the dynamics of cognitive functioning. In this investigation, our interest was in the development of both verbal and nonverbal (imaginal) processes that are subsumed under the rubric of representational thought.

At present, little research has addressed itself to the role of the family environment with regard to such functioning. In his theoretical statements, Sigel (1970, 1971, 1972) has suggested that parents play a vital role in the development of representational competence. He also proposes a more specific definition of representational ability. These abilities are taken to be fundamental human capabilities, with the quality influenced by the milieu in which the child is reared, among other things. Knowledge can be represented in a form different from but related to ostensive reality through the use of symbols. The following skills comprise such functioning: (1) the ability to transcend the physical environment and the immediate perceptual present by representing events, objects or situations in mental terms; (2) the ability to relate past to present and present to future; and (3) the ability to express these constructions in mental terms (Sigel, 1972).

According to distancing theory (Sigel, 1970, 1971, 1972), representational abilities are derived in part by events that separate the child from the immediate environment in a cognitive sense. Distancing behaviors can be operationalized to include classes of parental behaviors which "demand" the child to anticipate future actions or outcomes, to reconstruct past events,

to employ his imagination in dealing with objects, events, and people, and to attend to transformations of phenomena. Such behaviors encourage the child to actively make inferences, consider alternatives and reach conclusions on his own.

In essence, our argument is that representational thinking develops within the context of the whole organism. That is, biological and maturation factors are certainly primary factors, but the development of such competencies is also influenced by the demands of the environment. On the assumption that the cognitive environment the parents provide through distancing behaviors (inquiry strategies, for example) will vary as a function of their perspective of the child's capability, beliefs about child development and the position of a CH child in a family constellation, it is important to examine the relationship between parental beliefs and types of parental teaching strategies such as distancing, within the context of family size and ordinal position.

Language disorders: This theoretical framework raises fundamental considerations regarding language disorders. Distancing theory focuses in large part on the communicative environment the child lives in and emphasizes the parents' role in providing experiences optimal to the development of representational abilities. In addition, empirical research indicates that parental behaviors indeed have impact on the child's level of verbal abilities (see section Parental Influence on Children's Cognitive Development). A language disorder in the preschool child may itself produce effects that exacerbate the disability. That is, the child's level of language development is likely to affect the quantity and quality of language behaviors of those around him/her in a negative manner. The frequency of communicative overtures by family members is likely to decrease in quantity and quality. This would limit the child's input experiences as well as limit demands for the child's verbal and nonverbal participation. Yet, children evidencing a language disorder represent a group with potential for benefitting from parental distancing behaviors since they have intrinsic cognitive abilities which are impeded by a particular dysfunction in verbally representing events, objects or ideas.

Preschool children with a communciation handicap have been selected for the following theoretical and practical reasons: (1) this group is likely to benefit the most from distancing experiences and yet, by the very nature of their disability, are less likely to be provided with such experiences in the home environment; (2) early identification of family influence may provide a basis for embarking on remedial programs that focus on parent behaviors prior to elementary school entrance, hopefully preventing compounding of the child's learning problems; (3) limitations in the child's development of language are likely to be apparent in the child's speech and therefore are likely to be identified earlier than other specific learning disabilities; (4) when poor language development is not remediated early, it may well have negative effects on peer relationships, social skills, school adjustment, etc.; that is, the nature of the disability may lead to a set of negative outcomes that occur in spite of the child's basic intellectual abilities; and (5) language development is a full-time process, and a rich and primary source of language experience for the preschool child is in the functional communication of the family environment.

Sample

One hundred and twenty two-parent families participated in the study. Each of the families included a target child between the age of 3 years, 6 months and 5 years, 8 months. The number of children, spacing between children and ordinal position of the target child in the family varied.

Sixty families included a target child who was diagnosed by a service agency external to ETS (e.g., public school child study team, Project Child, speech and hearing clinics, private speech therapists) as having a language or communication disorder (CH). Each of these children had an audiogram to ensure that sounds in the normal speech range could be heard and were judged as having no hearing difficulty.

The remaining 60 families involved children with no known learning disability or handicap (NCH). Each family was matched with one of the families with a communication handicapped (CH) child in order to serve as a constrast group. Thus, the two samples were matched as closely as possible on target child's age, sex and ordinal position, parents' educational level, sex of the sibling closest in age to the target child, and number and spacing of children in the family.

The final CH sample was comprised of 10 families with an only child, 13 families in which the CH child was firstborn and 37 families with a later born (secondborn, thirdborn, etc.). The contrast sample (NCH sample), consisted of 9 families with an only child, 15 with a firstborn target child and 36 with a later born target child. One of the families classified as a firstborn contrast family was selected as a "match" for an only child CH family. However, the NCH family had a second child within a few weeks of testing and information on number and spacing of children in this family was included in analysis of demographic data. In addition, one NCH family with a firstborn target child was included as a "match" for a secondborn CH family. This was due to an inability to locate a contrast family in which parental educational level, sex and birth order of child, all corresponded to the CH family. Each sample had 43 male target children and 17 female target children.

The descriptive characteristics of the two groups of families are presented in Table 1. A 2 x 2 (CH versus NCH Group x Sex of target child) analysis of variance was conducted on each variable to determine if the two samples differed significantly in demographic characteristics. For the 70 families in which older siblings of the target child were assessed, the CH and NCH groups differed from one another in terms of the sibling's age [$F(1/67) = 4.04$; $p < .05$] and months spacing between sibling target ages [$F(1/67) = 5.43$; $p < .05$]. Siblings in the NCH group tended to be older than siblings in the CH group [means (and SD) = 97.43 (23.30) and 87.94 (15.19) months, respectively]. Spacing between the sibling and target children was also greater in the NCH group than in the CH group [means (and SD) = 44.94 (22.06) and 34.57 (13.83) months, respectively].

TABLE 1

DESCRIPTIVE CHARACTERISTICS OF PARTICIPANT FAMILIES

FAMILY CONSTELLATION, GROUP (CH VS. NCH) REPORTED IN MEANS AND (S.D.)

DEMOGRAPHIC CHARACTERISTICS		ONLY-CHILD		TARGET FIRST-BORN		TARGET LATER-BORN		TOTAL	
		CH N=9	NCH N=9	CH N=13	NCH N=15	CH N=38	NCH N=36	CH N=60	NCH N=60
TARGET CHILD'S AGE IN MONTHS		52.33 (6.18)	52.11 (5.69)	54.92 (8.20)	54.00 (7.04)	53.58 (7.02)	52.50 (7.68)	53.68 (7.10)	52.82 (7.19)
NEXT YOUNGER/OLDER SIBLING'S AGE IN MONTHS		0.0 (0.0)	0.0 (0.0)	18.85 (9.77)	24.40 (8.78)	90.03 (17.64)	98.72 (24.24)	71.52 (35.31)	76.86 (40.03)
MONTHS SPACING BTWEEN TARGET AND SIBLING		0.0 (0.0)	0.0 (0.0)	36.15 (12.10)	29.60 (7.73)	36.43 (16.35)	46.22 (23.06)	36.36 (15.24)	41.33 (21.15)
FATHER'S FORMAL EDUCATION IN YEARS		15.11 (2.71)	15.11 (2.98)	14.54 (3.15)	14.93 (2.94)	15.58 (2.48)	16.19 (2.12)	15.28 (2.66)	15.72 (2.50)
MOTHER'S FORMAL EDUACTION IN YEARS		14.44 (2.92)	14.44 (2.55)	14.46 (2.33)	14.20 (2.27)	14.34 (2.04)	14.33 (1.84)	14.38 (2.21)	14.32 (2.03)
FATHER'S AGE IN YEARS	A	3.22 (0.97)	3.00 (0.71)	3.15 (1.34)	2.73 (0.59)	3.66 (1.30)	3.67 (1.07)	3.48 (1.27)	3.33 (1.00)
MOTHER'S AGE IN YEARS	A	2.78 (0.97)	2.89 (0.60)	2.46 (0.97)	2.33 (0.62)	2.87 (0.81)	3.17 (0.77)	2.77 (0.87)	2.92 (0.79)
LENGTH OF MARRIAGE IN YEARS		9.11 (3.62)	8.89 (3.14)	7.92 (2.47)	7.20 (2.24)	10.42 (2.75)	11.86 (3.57)	9.68 (2.97)	10.25 (3.79)
FATHER'S INCOME IN THOUSANDS PER YEAR	B	19.89 (5.53)	25.00 (6.04)	25.38 (7.18)	26.60 (7.60)	27.35 (6.51)	27.78 (6.63)	25.78 (6.94)	27.07 (6.76)
MOTHER'S INCOME IN THOUSANDS PER YEAR	B	6.67 (6.18)	5.00 (5.57)	5.46 (6.41)	2.93 (3.10)	3.65 (5.39)	3.39 (2.98)	4.51 (5.76)	3.52 (3.49)
NUMBER OF CHILDREN IN FAMILY	C	1.00 (0.0)	1.00 (0.0)	2.00 (0.0)	2.13 (0.35)	2.76 (0.79)	2.56 (0.94)	2.33 (0.90)	2.22 (0.92)
TARGET'S BIRTHORDER	D	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	2.58 (0.86)	2.42 (1.00)	2.00 (1.03)	1.85 (1.04)
NEXT YOUNGER/OLDER SIBLING'S BIRTHORDER	D	0.0 (0.0)	0.0 (0.0)	2.00 (0.0)	2.00 (0.0)	1.49 (0.65)	1.42 (1.00)	1.62 (0.60)	1.59 (0.88)

A) AGE OF PARENT WAS INDICATED BY CATEGORIES CONSISTING OF 4 YEAR INTERVALS: 2=26-30, 3=31-45 YEARS.
B) INCOME WAS INDICATED BY CATEGORIES CONSISTING OF 3-4 THOUSAND DOLLAR INTERVALS; MIDPOINT OF INTERVAL WAS USED FOR THIS ANALYSIS MOTHERS INCOME WAS NOT NORMALLY DISTRIBUTED; MOST MOTHERS CHOSE THE LOWEST CATEGORY; A FEW MOTHERS CHOSE THE HIGHEST CATEGORY.
C) LARGEST CH FAMILY HAD 5 CHILDREN, LARGEST NCH FAMILY HAD 7 CHILDREN.
D) BIRTHORDER: 1=FIRST-BORN OR ONLY, 2=SECOND-BORN, ETC.

In addition, a significant Group x Target sex interaction was obtained for birth order of the siblings who were assessed, $F(1/67) = 4.20$; $p < .05$. Means (and SD) for the CH group were 1.38 (.52) for females and 1.52 (.70) for males. For the NCH group, means (and SD) for females was 1.89 (1.62) and for males was 1.15 (.37). With the case of birth order, descriptive data provides more information than averages. The interaction effect is probably due to the fact that one sibling in the NCH female group was a sixth-born child (5 firstborns and 3 secondborn siblings comprised the rest of the group). The siblings in the NCH male group were 22 firstborns and 4 secondborns. The siblings of the CH female target children were 5 firstborns and 3 secondborns. Siblings of CH male target children consisted of 16 firstborns, 8 secondborns and 3 thirdborns.

Two significant main effects were obtained for sex of the target child. Both mothers' educational level [$F(1/117) = 4.50$; $p < .05$] and fathers' educational level [$F(1/117) = 5.77$; $p < .05$] varied with sex of child. Mothers of boys and fathers of boys tended to have higher educational levels than parents of girls [means (and SD) for mothers = 14.61 (2.11) and 13.71 (2.01) and for fathers = 15.85 (2.77) and 14.62 (2.61)]. All subsequent analyses comparing groups based on CH versus NCH or male versus female target children were conducted with demographic variables used as covariates if significant correlations with outcome variables were obtained.

Families were recruited through contact with service personnel (e.g., speech and hearing clinics, private therapists), public school systems, newspaper advertising and posters displayed in waiting rooms and public places. Participating families were paid $25.00 as compensation for their driving expenses, babysitting and time.

Assessment Materials and Procedures

Three classes of materials were administered to each family: (1) Parent questionnaires and interviews, (2) child assessments and screening tests, and (3) observations of parent-child interactions.

Parent Assessments

General procedures: Each parent was seen alone for a single session for the questionnaires and the interviews, which were recorded on a cassette tape. The parent-child interactions were videotaped through a one-way mirror. All measures were administered by female research assistants and were independently coded at a later date by a research assistant. Order of administration of interviews and parent-child interaction tasks was counter-balanced across mothers and fathers. A brief description of each of the measures is presented below. Manuals describing the content, administration and scoring procedures for each instrument are appended to this report (Appendix A).

Parent questionnaires and interviews: The three aspects of these data pertained to: (1) Communication strategy preferences and predictions, (2) beliefs about child development processes, and (3) views of the way their family functions as a unit and particular needs of individual family members. The measures used to assess each area are briefly described below.

(1) Communication strategies preferences and predictions. The content of the questionnaire and interview schedule used to assess parents' views of child-rearing communication strategies consisted of 12 hypothetical situations involving a parent and a four-year-old child. Four response options that represented different communication styles followed each hypothetical situation--distancing, rational authoritative explanations, direct authoritative statements and diverting strategies. Parents were first asked to rank each of these options from best (#1) to worst (#4) ways to handle the situation.

After the parent completed the ranking procedure for all 12 items, she/he was interviewed about the 12 situations. The parent was asked what was the best or ideal way to handle the situation (communication strategy preference). Rationales concerning why that strategy was best were then elicited.

The types of strategies parents preferred were coded into categories and summed across the twelve items. The categories were: distancing, rational-authoritative, direct authoritative, authoritarian, diverting, activity with the child (e.g., demonstration, experimentation) and passivity (e.g., withdrawal, nonintervention). Thus, each parent received a score for each type of strategy preference ranging from 0 to 12.

The rationales for these strategies were coded in terms of childrearing goals (cognitive, personal-social, behavior management, assessment, physical, nonchild), childrearing orientation (parent-centered, child-centered, parent role-centered, other-centered), temporal focus (active or passive) and constraints (on parent, child, setting or other) according to frequency of reference to each category.

Three coders scored these interviews directly from the cassette tapes. Pairs of coders, working independently, scored 20 of the 240 tapes for reliability purposes. Range of agreement between pairs of coders was from 87% to 100% (mean = 98.02%). In addition, all three coders independently scored six of the tapes. Range of agreement between all three coders was from 71% to 100% (mean = 91.05%). Agreement on all aspects of the interview was high (Strategies = 94%; Goals = 89%; Orientation = 92%; Constraints = 97%; Temporal Focus = 99%).

(2) Beliefs about child development processes were assessed using 22 sets of probes. Each set was comprised of an initial question aimed at establishing the parents' view of the capabilities of most four-year-old children (e.g., "Does a four-year-old understand time?"). Subsequent questions elicited parents' beliefs about developmental and learning processes

that account for change in normally developing children (e.g., "How does a four-year-old eventually come to understand time?"). Parental responses were scored as representing one or more of sixteen possible developmental processes. In addition, each response was coded on a four-point Likert scale indicating that the child was an active processor (4) or a passive recipient of knowledge (1). Finally, the parents' confidence in his/her beliefs was indicated on a four-point Likert scale.

At the close of the interview concerning beliefs about children in general, three sets of probes were administered again, relative to the target child's development (e.g., "Does Timmy understand time?"; "How will Timmy eventually come to understand time?"). The parents' view of the capability of their own child was coded as either: (1) the same as for children in general, (2) below that of children in general, and (3) above that of children in general for each of the three items. Processes accounting for development of children in general and their own child in particular were coded as to similarity on a four-point Likert scale. The parents' references to processes that could account for their own child's development were also coded according to a four-point active-passive scale.

Four scorers coded these interviews. Each scorer independently coded nine of the tapes. The mean interrater agreement across the entire instrument was 81.11% (range = 0-100%). Various coder pairs independently scored an additional ten interviews, yielding an agreement of 81.17% (range = 0-100%). Coder ratings of parents' confidence in their beliefs and of similarity of processes that account for development in general versus development in one's own child evidenced the lowest interrater agreement (means = 60.56% and 60.81% respectively). High degrees of agreement were obtained for scoring of processes that account for children's development in general (mean = 96.02%), views of children's capabilities (94.80%), coder ratings of parental beliefs about developmental processes on an active-passive (4-point) scale (84.57%), views of the parents' own child's capabilities (87.68%) and active-passive ratings of processes that account for parents' own child's development (83.52%).

(3) Views of the family unit and individual family members were elicited through an interview administered immediately upon completion of discussion of communication strategies and child development beliefs. Parents were asked a series of questions concerned with:

a) expectations about similarities and differences between children in the family; sources of similarities and differences.

b) changes in time the parent spends with each child.

c) the type, source and permanence of the target child's needs.

d) allocation of time and money to each family member.

e) person(s) responsible for major financial decisions.

f) circumstances under which one child is granted larger portions of family resources than siblings.

In most cases, parents' responses to these probes were coded in a categorical manner. That is, expectations concerning whether two children in the family would be more alike or more different from one another were coded as either: (1) similar, (2) different, (3) mixed, or (4) no expectations cited. Explanations for similarities and differences were scored as due to: (1) genetics, (2) environment, (3) both genetic and environmental factors.

The only exceptions to the use of coding a single category occurred for rationales for changes in time the parent spent with each child and for allocation of time and energy to each family member. In the former case, the parent could refer to many reasons (e.g., more child-related duties, spends group time with children, needs of younger children greater than that of older children, etc.) for increases or decreases in time spent with the child. Each rationale was coded in such cases. Allocation of time and of energy required that the parent rank each family member in terms of the share of money and of the parents' energy and attention that was directed to him/her.

Three scorers coded these interviews. Eighteen of the tapes were independently scored by pairs of coders. Interrater agreement ranged from 95% to 100% (mean = 98.27%). An additional eight interviews were independently scored by all three coders. Range of agreement was from 90% to 100% (mean = 96.83%).

Observations of parent-child interactions: Each parent performed two tasks with each child included in the study. A story-telling task and an origami task (paper-folding) were used. The order of administration of the two types of tasks was counterbalanced across mothers and fathers and targets and siblings.

Two stories and two origami tasks were used with the targets. Two versions of each task were necessary so that mothers and fathers would have different tasks to do with the child. The two versions of each task were equated for length and theme of the story tasks and for difficulty of the paper-folding tasks. The two stories used were edited versions of Hello Rock by Roger Bradfield (1965) and A Rainbow of My Own by Don Freeman (1966). The two origami tasks were an airplane and a boat.

For each interaction, the parent was seated at a low table facing a one-way mirror. When the story-telling task was presented first, the book was placed on the table. When the paper-folding task was administered first, a stack of 8-1/2" x 8-1/2" paper was placed on the upper left corner of the table and a 40" x 30" rectangular board with each step of the folding process represented by a piece of paper was on an easel to the parent's left. The parent was told to go through the story as she/he would at home, or to teach the child to make a boat/airplane by folding the paper. The child was then brought into the room, and the door was closed as the experimenter exited. Upon completion of the first task, the child left the

room, materials from the first task were removed and materials and instructions for the second task were introduced. The second task was then administered. Several toys that were not related to the tasks were left in the room at all times. These props were included to distract the child, to increase the likelihood of obtaining spontaneous measures of parental management and structuring of the task when a child became distracted.

Each parent-child interaction was videotaped through the one-way mirror. Videotaping began when the child entered the room and continued until the task was completed or until five minutes elapsed (whichever occurred later). A time display generator was used to record elapsed time of interaction directly onto the videotape.

Five minutes of interaction were coded directly from the videotapes for each task, yielding two sets of scores for each of the two parent-child dyads. A coder first viewed the entire videotape of one task, rating the parent for warmth and for sensitivity to the child's ability and affective level on a 4-point Likert scale. Then the first two minutes, the last two minutes and one minute at the midpoint of the interaction were coded for frequency of types of parent and child behaviors.

Each parental utterance was considered a unit of behavior, and nonverbal behaviors that accompanied or followed the utterance were coded with that utterance, as was the child's response. Parent behaviors were coded according to: (1) form of parental utterance (statement, question, imperative); (2) verbal emotional support (approval, disapproval); informational feedback; (3) nonverbal management behaviors (positive-physical affect, negative-physical affect, helping or takeover, modeling or demonstration); (4) nonverbal task structuring (e.g., pointing, physically directing child's manipulation of task materials); (5) communication cohesion behaviors (attention-getting, redirecting, diverting, out of contact, verbal markers, verbal modeling); and (6) the content or mental operational demand of the utterance (low = label, observe, describe, demonstrate; intermediate = sequence, reproduce, describe or infer similarities/differences, symmetrical/asymmetrical classifying; high = evaluate, infer cause-effect/affect/effect, generalize, plan, propose alternatives, conclude, transform, resolve conflict). Child behaviors were coded as: (1) actively engaged in the task or interaction (provides relevant response, asks a question pertaining to current discussion or task); (2) passively engaged (listening oriented toward parent or task); and (3) nonengaged (active involvement with distractor in room and not with parent, not attending to parent or task). In addition, the child's performance in folding the object during the origami task was rated on a Likert (4-point) scale.

The parent-child interactions were scored by four coders. Interrater agreement between pairs of coders who independently scored 96 interactions ranged from 63.5% to 100% (mean = 91.55%) for coding of parental behaviors. Warmth and sensitivity were rated on a 4-point Likert scale which only allowed for complete agreement (100%) or complete disagreement (0%). The mean interrater agreement over 98 ratings was 90% for warmth and 84% for sensitivity.

Child Assessments

General procedures: The child assessments used were the WPPSI (screening), three types of memory tasks, a mental rotation task, an anticipatory imagery task, and a seriation task. These tests were administered to each of the target children ($N = 120$). In addition, siblings who were older than the target child were administered all tasks except the WPPSI and one memory task. The older sibling was not assessed in families in which the sibling was over 14 years old. Thus, a total of 70 siblings were assessed, 35 in the CH group and 35 in the control group. The WPPSI and one memory task were administered in the child's home for all target children as it was used as a screening instrument as well as an outcome variable in the study. All other assessments were administered in two sessions, which occurred within a three week period, and were conducted at Educational Testing Service in Princeton, New Jersey. Manuals describing content, administration, and scoring procedures for each instrument are appended to this report (Appendix A).

Children's cognitive tasks: The anticipatory imagery task was adapted from Piaget and Inhelder's (1971) kinetic reproductive imagery task #5 (pp. 86-94). Two sets of materials were used. The first set was used in the training phase of the task and the other was used in the experimental phase, after the child evidenced comprehension of the task requirements. The apparatus used in training consisted of a straight, flat board with a base 25.5 inches long (65 cm) by 6 inches wide (15.5 cm). Centered in the base was a vertical upright board running the length of the base and standing 3 inches high (8 cm) by 1-1/8 inches deep (3 cm). Five small red lights were spaced 4-1/8 inches apart (10.5 cm) in the middle of the upright board. The lights were recessed into the depth of the board, so that they were flush with its surface. The wiring for the lights was tucked into a groove running lengthwise along the back side of the board where the subject couldn't see them. The wires were connected by means of a detachable plug into a separate control box that allowed any single light to be turned on by means of magnetic switches. The upper surface (1-1/8 inches wide, or 3 cm) of the upright board was covered with a strip of steel sheeting, so that magnets could adhere to it. Boards 5-1/4 inches wide (48 cm) by 8 inches high (76 cm) that rose vertically from the base board served as legs when the board was inverted. Two identical turtles approximately 1/2 inch in diameter (1.5 cm) with magnets attached to their bases were also used as materials.

The second apparatus was used in the experimental phase of the task and consisted of an open figure 8 suspended lengthwise by metal tubing approximately 4 inches (10 cm) above a base board 25.5 inches long (65 cm) by 8-3/4 inches wide (22 cm). The figure 8 was two feet long (60 cm) by one foot high (30 cm) and was 1-1/2 inches thick (4 cm). The upper and lower surfaces of the track were covered by a continuous strip of steel sheeting, so that the magnets would adhere to the track. Seven small red lights were located on the outside edge of the track between the two metal surfaces. As with the training apparatus, the wiring for the lights was tucked out of sight along the back of the figure 8, and was connected to the control box.

Each child was seen individually. The child and the examiner sat side by side at a low table. The procedure consisted of two phases: (1) a training phase to ensure that the child understood the task requirements, and (2) the testing phase.

The training board was placed on the table directly in front of the child, within easy reach. One of the turtles was placed at the extreme left of the training track. The examiner demonstrated that the turtle could only "walk" forward, first by "walking" her fingers along the track, and then by moving the turtle from one to another of the 5 lights, which the examiner turned on one after another. After such demonstration, the child was given the other turtle, which was for his/her own use. The child was taught to duplicate the performance of the examiner, placing his/her turtle on the track at the appropriate place when any of the lights were on. Any errors of location and orientation were corrected as they occurred.

After training with the upright board, the examiner turned the apparatus over so that it rested on its legs. This relocated the metal track from the top of the apparatus to the underbody of the apparatus. Now the turtle had to hang upside-down in order to "walk" along the track. The child redemonstrated his/her ability to walk the turtle along from light to light in this upside-down orientation using the same procedures as before. Again, errors of location and orientation were corrected.

The testing phase began immediately upon completion of the training phase. The materials used in training were removed from view. The figure 8 was plugged into the control box and placed on the table where the training board had been. The examiner placed one turtle above the lower left light, on the track, facing to the right. As in the training phase, the examiner explained that the turtle could only go forward, and demonstrated this by "walking" her fingers a short distance around the nearest loop of the figure 8. Without further demonstration or explanation the child was encouraged to take the other turtle and place it on the track at the various appropriate locations as the examiner turned each light on in a specified random sequence. No feedback was provided for any of the test trials. The location and orientation of the turtle's placement at each light was recorded by the examiner on the diagrammatic answer sheet.

After these initial 6 trials, the examiner demonstrated the movement of the turtle to each light by moving one turtle from light to light in sequence. The child then copied this procedure by running the turtle around the figure 8. Then the 6 trials were repeated, in a different random order, without further demonstration or feedback. The child's placements of the turtle were again recorded by the examiner on an answer sheet. Each item was scored separately in terms of success versus failure in placement. Since the scores for the initial and final six trials were highly correlated for both the CH and the NCH groups ($\underline{r}$'s > .75) and means for initial and final trials did not differ significantly from one another, correct scores were summed across all 12 items.

A mental rotation task was adopted from Marmor's (1975, 1977) work, in order to investigate whether language disordered children would evidence a linear reaction time trend that has been assumed to indicate the use of mental imagery in problem-solving. Two sets of materials were used. The first set consisted of three panda bears, approximately 15 cm x 7 cm, made out of plywood and 24 slides of upright bears. The second set of materials consisted of 60 slides of pairs of bears. A slide projector, a 21.5 cm x 21.5 cm screen, reaction time levers, and a microprocessor that controlled slide projection and recorded reaction time and correct selections were additional equipment. All bears were depicted with either their left or right arm raised.

All children were tested individually. The test was administered in two sessions. In the first session the child was trained on same-different judgments and a criterion test was administered. If the child failed the criterion test, the session was terminated and the second session was omitted from the test battery. If the child passed the criterion test, the child was given mental rotation training and then received 30 of the test items during the remainder of the first session. At the second session the child was again given the mental rotation training, and the final 30 test items were administered.

The three plywood bears were used to train same-different judgments. Two of the bears had the same arm raised and one bear had his other arm raised. Through demonstration, explanation and corrected practice, the child was taught to discriminate between same and different pairs. The ability to discriminate was then tested with the criterion tests. Twenty-four slides, half with same pairs of bears and half with different pairs, were presented in a specified random order. The child pushed the lever on the left when stimuli were the same and the other lever when they were different. The microprocessor recorded the answer automatically and held it in memory. If the child responded correctly on either the first 10 consecutive trials or on 20 of the 24 trials, output was printed and mental rotation training trials were then administered.

During mental rotation training, the child was given seven trials with two of the plywood bears. The bears were presented with one upright and one rotated. The child pressed a lever to indicate same-different judgments and the experimenter manually rotated the bear to the upright position to check whether the two stimuli matched. For the remaining rotation trials, the child was allowed to rotate the bear after the lever had been pushed in order to check his/her answer.

The total 60 test trials consisted of six slides of 0°, 30°, 60°, 120° and 150° clockwise rotations of the bear on the right hand side of the screen. The bear on the left was always depicted as upright. The order of these 60 slides was presented in a specified random order. The first 30 slides were administered immediately upon completion of mental rotation training. The intertrial interval between slides was one second, during which an ambient colored slide was projected. For half of the trials, the

bears were the same and they differed for the other half. Reaction time in hundredths of seconds as well as errors were recorded and printed out by the processor.

During the second session, all children who passed the criterion test were again given mental rotation training. The remaining 30 test trials were then administered.

Simon was a commercial round plastic game with four colored panels arranged around a control panel. After pressing the START button on the control panel, one of the panels was illuminated, accompanied by a tone. The player repeated the signal by pressing the same color panel. The first signal was then duplicated and another signal was added. The game continued in this manner until the player pressed a panel out of sequence. At the end of the game the last sequence could be replayed in full by pressing the LAST button on the control panel. This memory game was played by the target children as part of a break during the WPPSI administration.

Before turning Simon on, the experimenter demonstrated where to press the panels. Following the sequences Simon sets, the experimenter played the game. If the child appeared confused and lost, another sequence was played by the experimenter with the child watching. When the child responded and was eager to participate, the experimenter played Simon with the child. The child was helped to follow the sequence, the experimenter pushing some panels and the child pushing some with the experimenter's participation gradually withdrawn.

After this familiarization period, the START button was pressed again and a new sequence was begun. The child now played the game without help. The number correct in a sequence was recorded by the experimenter. This procedure was followed for a total of three games. The child's highest level of performance was used in analyses.

Children's memory for sentences was assessed using picture arrangements as the response measure. The task required the child to transform an orally presented sentence to ordered pictorial representations. An easel, picture cards, score sheet and pencil were used as materials. For each of eight items, the experimenter read the child a "story" without the picture cards in view. Then the picture cards were arranged on the table in a prescribed scrambled order. The child's task was to rearrange them in proper sequence, as the story had been told.

A memory and sequencing task (MAST) was also administered as part of the child assessment battery. The task involved presentation of pictures of items in a sequence, which the child was required to reconstruct by ordering cards with identical pictures printed on them. Two sets of materials were used, one consisted of a set of cards that depicted meaningful pictorial objects while the other set of cards depicted unusual geometric forms.

Two training trials consisting of two items each were presented first. The child was given three cards and was helped to arrange only the two that

had been presented in the correct order. A total of sixteen test trials were administered with each set of materials. In each case, the child's task was to order the cards in the manner in which they were presented, eliminating the one "distractor" card included in each trial. Four trials consisted of two cards, four trials consisted of three cards, and so on, up to five cards. Number of cards placed in the correct position was scored, yielding a maximum possible score of 56 for the pictorial objects and 56 for the geometric forms.

The seriation task was also divided into a training and testing phase. For training, three pictures with the items progressively smaller than one another were presented, followed by a blank space. The child selected one of four response cards to complete the seriation and was given feedback concerning his/her choice. This procedure was followed for two trials.

The same procedure was then followed for the testing phase, which consisted of five sets of pictures. In each case, three objects were ordered along some dimension and the child's task was to select the picture that "goes in the empty space" from four response options. The number correct over the five trials was recorded.

Results and Discussion

Overview

In this section we shall present our findings addressing the following questions:

1. Do parents of CH children differ from parents of NCH children in their beliefs regarding the course of the children's cognitive growth? We would expect that such differences would exist since parents of CH children have unique opportunities to observe cognitive growth where children have difficulty expressing themselves linguistically as well as understanding verbal messages. Such experiences would be influenced by the opportunities these parents have to compare the development of their NCH children. Where parents of NCH children have as their frame of reference children who have no disabilities, parents of CH children have more extensive experiences working with a broader spectrum of children, including children with disabilities.

2. Do parents of CH children differ from parents of NCH children in their communication strategies? The rationale for expecting differences here is that the CH child's handicap is particularly one of communication and hence it seems reasonable to expect parents to communicate in ways appropriate to their children's difficulty.

3. Do parents of CH children differ from parents of NCH children in their teaching strategies? One would predict that parental teaching strategies would be different with communication handicapped children because of the verbal ability and special problems of these children.

4. What is the relationship between parental beliefs regarding child development and parent teaching strategies? Belief systems, we argue, influence the way parents behave toward their children, irrespective of their children's handicap. In other words, parental beliefs should predict to their teaching behavior with their children.

5. How do parental teaching strategies influence children's cognitive functioning, particularly their representational competence? It will be recalled that teaching strategies are categorized in the context of their distancing characteristics. The question then is How does the level of distancing strategies parents use influence the children's representational competence? We argue that the greater the frequency of high mental operational demands the parents use, the more competent the children will be in dealing with representational thinking tasks.

6. Finally, How do these complex variables (parental beliefs, parental teaching strategies and children's cognitive outcomes) influence one another? Fundamentally, our position is that the belief-teaching-outcome chain is embedded in a causal feedback system since actions of parents are not independent of the actual or anticipated behaviors of children.

Results and Discussion

1/2. Comparison of beliefs and communication strategies of parents of CH and NCH children: In view of the limited set of findings for beliefs and communication strategies, we shall combine the results in one section. Analyses of covariance to answer our first two questions revealed very few differences for beliefs and communication strategies between parents of CH and NCH children.

As for beliefs, two significant differences were found between the parents of CH and NCH children. More parents of CH children stated the belief that negative feedback (unpleasant consequences) is a relevant basis for cognitive development and learning than parents of NCH children: $F(1,235) = 11.83$, $p < .01$ ($\bar{X}$ of CH mothers + CH fathers = 10, $\bar{X}$ of NCH mothers + NCH fathers = 7.47). A second difference revealed that parents of CH children viewed children as passive recipients of knowledge: $F(1,235) = 5.56$, $p < .05$ ($\bar{X}$ of CH mothers + CH fathers = 68.20, $\bar{X}$ of NCH mothers + NCH fathers = 72.24). See Table 2 for means of each of the belief variables.

This latter finding is of interest since it should have direct bearing on how parents would teach their children. Thus, we hypothesized that the more parents view children as active learners, the more parents would use high level distancing strategies. The converse would be expected for parents holding a passive view of children's knowledge acquisition. (These results are presented on pages 44-50.)

Turning now to communication strategies, we again found through analysis of covariance relatively few differences between CH and NCH parent groups in their preferred strategies. Parents of NCH children were more child-oriented than parents of CH children: $F(1,235) = 6.60$, $p < .01$ ($\bar{X}$ of CH group = 37.45, $\bar{X}$ of NCH group = 41.46). The mothers of NCH children were more child-oriented than all other parents: $F(1,234) = 3.99$, $p < .05$ (see Table 3 for means of each parent group).

Thus, our expectations that parents of CH and NCH children would differ in beliefs and in communication strategies were not borne out. Rather, differences were minimal. These results are intriguing because they appear at first blush counter-intuitive. Should not the parents of CH children differ from parents of NCH children in their beliefs if their experiences with their handicapped children provide an opportunity for a new perspective on development? On further thought, it may be the case, and in fact it was the case with our sample, that parents' core beliefs of how children develop cognitively transcends specific disabilities. In other words, parents, irrespective of the special nature of their children, believed that children develop cognitively in a similar way. The fact that children had particular problems did not mean that they developed differently.

Another source of data supporting the finding that the parents in the CH group viewed their children similar to NCH children developmentally were results obtained from part of the interview called the Family Influences on

TABLE 2

MEANS AND STANDARD DEVIATIONS (SD) FROM GROUP ANALYSES ON CONSTRUCTION VARIABLES

	CH MOTHER N=60	CH FATHER N=60	NCH MOTHER N=60	NCH FATHER N=60
ACCUMULATION	5.17 (3.85)	5.22 (3.86)	5.30 (2.98)	4.73 (3.13)
COGNITIVE PROCESSES	3.65 (2.63)	4.40 (3.38)	4.17 (3.10)	4.28 (3.42)
DIRECT INSTRUCTION	14.82 (5.81)	14.83 (6.39)	14.82 (5.92)	15.32 (5.52)
EXPERIMENTATION	3.97 (3.06)	4.12 (2.97)	4.85 (3.11)	4.43 (3.24)
EXPOSURE	11.35 (3.69)	12.32 (3.93)	11.72 (3.52)	11.92 (4.71)
MANIPULATE ENVIRONMENT	5.58 (3.08)	5.60 (3.29)	5.43 (3.03)	5.20 (3.16)
NEGATIVE FEEDBACK	4.85 (3.27)	5.15 (2.56)	3.42 (2.55)	4.05 (3.09)
POSITIVE FEEDBACK	5.47 (2.67)	5.22 (3.16)	5.28 (3.45)	4.78 (3.24)
SELF REGULATION	4.07 (2.86)	3.73 (3.11)	4.45 (3.14)	3.97 (2.50)
ACTIVE-PASSIVE SUM	33.32 (6.59)	34.88 (6.82)	36.57 (6.62)	35.67 (6.89)
CONFIDENCE RATING	2.73 (0.99)	2.60 (1.06)	2.82 (1.00)	2.80 (0.88)
NUMBER OF CONSTRUCTIONS	39.83 (8.94)	41.22 (8.43)	40.37 (7.28)	39.45 (7.73)

TABLE 3

MEANS AND STANDARD DEVIATIONS (SD) FROM GROUP ANALYSES ON COMMUNICATION VARIABLES

	CH MOTHER N=60	CH FATHER N=60	NCH MOTHER N=60	NCH FATHER N=60
STRATEGIES:				
DISTANCING	6.42 (5.61)	6.18 (4.90)	7.22 (5.77)	6.17 (5.69)
RATIONAL AUTHORITATIVE	7.75 (4.25)	8.60 (4.34)	8.42 (4.75)	9.43 (4.68)
GOALS:				
COGNITIVE	21.82 (5.94)	21.62 (6.21)	22.37 (5.47)	22.22 (6.12)
PERSONAL-SOCIAL	11.30 (5.10)	12.52 (5.66)	12.85 (4.49)	12.12 (4.63)
MANAGEMENT	12.62 (5.00)	12.55 (5.30)	12.40 (4.46)	12.30 (5.33)
TOTAL	29.70 (3.80)	31.18 (6.12)	30.70 (4.15)	30.45 (3.26)
ORIENTATIONS:				
PARENT ROLE	42.75 (14.23)	39.98 (12.26)	39.13 (15.41)	40.80 (13.52)
CHILD	36.27 (12.38)	38.63 (11.58)	43.47 (12.01)	39.45 (13.45)
TOTAL	50.02 (8.56)	49.30 (6.70)	52.03 (8.92)	49.43 (7.76)
CONSTRAINTS:				
CHILD	5.80 (3.61)	5.97 (4.54)	5.27 (4.56)	5.07 (3.31)
TOTAL	8.37 (5.14)	9.02 (5.75)	7.53 (6.09)	7.43 (4.94)

Childrearing Interview (FICI). Each parent was asked to answer the questions at the beginning of the interview in terms of children in general from which the parents' communication strategies and beliefs about how a child develops and learns (constructions of the child) were obtained. In the FICI, the parents were given the chance to talk about how their own child learned about three topics posed in the initial interview: the concepts of time, perspective taking, and rules. The descriptions the parent gave regarding his/her own child were compared with what had been said about children in general: (a) were the developmental processes the same, more similar, more different, or totally different for the parent's own child compared to children in general?; (b) was the parent's own child at the same stage, at a lower stage, or at a higher stage of development as children in general in relation to each of the topics (time, perspective taking and rules)? These results are presented in Tables 4 and 5 in terms of frequencies of parental responses.

As one can see from inspecting Table 4, most parents, independent of their own child's handicap, believed that their own child used the same or similar developmental processes on all of the topics (time, perspective taking, and rules) when compared to children in general. However, the number of references to more different and totally different developmental processes increased when parents were asked about the concepts of perspective taking and rules. The NCH group mothers referred to the more different and totally different categories relatively more often than the same/similarity categories when discussing the topic of learning about rules. Two possibly contradictory inferences could be drawn from this increase in frequencies of the NCH group mothers' references to their own child being more different/totally different than children in general: on the one hand, they could have expected more of their own children than the children demonstrated; or on the other hand, their own children's development could have exceeded children in general.

Inspection of Table 5 may help resolve this apparent contradiction. The table describes the parent's views of the child's developmental stage. On all three concepts (time, perspective taking, and rules) most parents, independent of the child's handicap, viewed their own child as being at the same developmental stage as children in general. The number of parents viewing their own child as being at a lower stage than children in general increased only for the concept of rules. This could suggest then that the topic of learning rules was believed by parents to be difficult for all children in the sample. It is interesting to note that very few parents in either group viewed their own child as at a higher stage than children in general on any of the concepts.

In summary, although no statistical tests were performed, from inspection of the frequencies of the parents' responses, one can say that all of the parents viewed their own child as similar to children in general. These results are consistent with our finding of few differences in parental beliefs between the CH group and the NCH group.

TABLE 4

FREQUENCIES OF PARENTS' BELIEFS OF DEVELOPMENTAL PROCESSES COMPARING THEIR OWN CHILD TO CHILDREN IN GENERAL

DEVELOPMENTAL PROCESSES (INVOLVED IN)	MOTHERS OF CH	MOTHERS OF NCH	FATHERS OF CH	FATHERS OF NCH
LEARNING ABOUT TIME				
SAME	25	23	21	24
MORE SIMILAR	18	27	25	22
MORE DIFFERENT	11	3	2	5
TOTALLY DIFFERENT	5	7	12	7
NO ANSWER	1	0	0	2
TOTAL	60	60	60	60
LEARNING ABOUT PERSPECTIVE TAKING				
SAME	19	27	21	16
MORE SIMILAR	21	15	19	21
MORE DIFFERENT	9	9	5	7
TOTALLY DIFFERENT	10	9	14	16
NO ANSWER	1	0	1	0
TOTAL	60	60	60	60
LEARNING ABOUT RULES				
SAME	11	11	8	12
MORE SIMILAR	20	16	26	26
MORE DIFFERENT	16	13	6	7
TOTALLY DIFFERENT	11	20	20	14
NO ANSWER	2	0	0	1
TOTAL	60	60	60	60

TABLE 5

FREQUENCIES OF PARENTS' EVALUATIONS OF OWN CHILD'S DEVELOPMENTAL STAGE COMPARED TO CHILDREN IN GENERAL

DEVELOPMENTAL CONCEPT	MOTHERS OF CH	MOTHERS OF NCH	FATHERS OF CH	FATHERS OF NCH
TIME				
OWN CHILD AT SAME STAGE AS CHILDREN IN GENERAL	40	37	37	32
OWN CHILD AT LOWER STAGE THAN CHILDREN IN GENERAL	15	19	21	24
OWN CHILD AT HIGHER STAGE THAN CHILDREN IN GENERAL	3	3	2	4
NO ANSWER	2	1	0	0
TOTAL	60	60	60	60
PERSPECTIVE TAKING				
OWN CHILD AT SAME STAGE AS CHILDREN IN GENERAL	37	41	42	40
OWN CHILD AT LOWER STAGE THAN CHILDREN IN GENERAL	18	17	16	16
OWN CHILD AT HIGHER STAGE THAN CHILDREN IN GENERAL	3	1	2	3
NO ANSWER	2	1	0	1
TOTAL	60	60	60	60
RULES				
OWN CHILD AT SAME STAGE AS CHILDREN IN GENERAL	28	28	30	31
OWN CHILD AT LOWER STAGE THAN CHILDREN IN GENERAL	23	24	20	20
OWN CHILD AT HIGHER STAGE THAN CHILDREN IN GENERAL	6	6	9	8
NO ANSWER	3	2	1	1
TOTAL	60	60	60	60

3. Comparison of the teaching strategies of parents of CH children and parents of NCH children: Before comparing the CH and NCH parents' teaching behaviors we need to consider the tasks that were used in the parent-child interactions. It will be recalled that the two teaching tasks could elicit different teaching strategies due to task requirements: the paper-folding task was a highly structured sequencing task, whereas the story-telling task allowed greater freedom for parents in how to proceed. In spite of task differences, we can ask whether there was any consistency in parents' behaviors across these two tasks. Did teaching strategies vary with the task they were teaching or did they have some generalized approach which may have been influenced by the task, but may have transcended task demands?

Before presenting the results of the intercorrelations of parental behaviors on the paper-folding and story-telling tasks, it should be made clear that not all categories of teaching strategies occurred in each task. Intrusions, reading activity, imperatives, and task structuring are four categories that did not appear on both tasks. The remaining categories were intercorrelated between the two tasks and these correlations are presented in Table 6 for each of the four samples of parents (mothers and fathers of CH children and mothers and fathers of NCH children).

Three categories of responses can be identified: teaching strategies, reinforcements, and parental personality characteristics. We would expect greater differences between tasks for teaching strategies than the other two categories since the task demands could influence how one teaches, whereas parental patterns of reinforcement and personal-social characteristics would be enduring and hence not vary with the task.

Correlations of parent teaching strategies on the paper-folding and story-telling tasks were computed for each of the four parent groups. Mothers of CH children were generally consistent in their behaviors within each of the correlations (correlations were all significant and positive). Fathers of CH children, however, were more variable and less consistent. Mothers of NCH children were also more consistent than fathers of NCH children in their teaching strategies. The use of approvals for child performance varied with the fathers of CH children showing the greatest consistency. As for the personality factor (warmth and sensitivity), all parents were consistent. These results indicate that how parents interacted with their children was perhaps contingent on the task, but overall they seemed to be relatively consistent in their expression of warmth and sensitivity. It should be pointed out that the parents' warmth was not related to their use of approvals (correlations range from -.02 to .14 over all groups of parents). So, parents can express warmth and sensitivity to their children without necessarily expressing these feelings in terms of approvals.

To help understand the consistency issue we compared the relative frequency of use of parents' teaching strategies. Inspection of Tables 7 which contains $\bar{X}$ scores of each of the sub-groups (mothers of CH, Fathers of CH, etc.), reveals that not only the $\bar{X}$ scores but frequency

TABLE 6

CORRELATIONS BETWEEN PARENT BEHAVIORS
ON PAPER TASK WITH BEHAVIORS ON STORY TASK

	CH GROUP(N=60)		HCH GROUP(N=60)	
PARENT BEHAVIORS	MOTHERS	FATHERS	MOTHERS	FATHERS
MOD: HI	.51*	.35*	.51*	.24
MED	.30*	.17	.43*	.20
LO	.42*	.25*	.16	.11
STATEMENTS	.48*	.36*	.42*	.36*
QUESTIONS	.47*	.16	.48*	.29*
APPROVALS	.35*	.54*	.23	.17
NONVERBAL TASK STRUCTURING	.35*	.32*	.40*	.18
ATTENTION GETTING	.75*	.64*	.51*	.52*
WARMTH	.65*	.77*	.70*	.74*
SENSITIVITY	.58*	.56*	.60*	.56*

* THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .25$, $p < .05$.

TABLE 7

MEANS AND STANDARD DEVIATIONS (SD) FROM GROUP ANALYSES ON PARENT BEHAVIOR VARIABLES

	CH MOTHER N=60	CH FATHER N=60	NCH MOTHER N=60	NCH FATHER N=60
FORM: STATEMENTS				
PAPER	25.08	24.67	25.18	25.83
	(8.30)	(8.27)	(8.13)	(8.98)
STORY	18.88	20.00	17.97	19.42
	(8.94)	(8.42)	(7.63)	(7.83)
QUESTIONS				
PAPER	24.85	22.98	24.45	25.25
	(10.30)	(10.64)	(9.32)	(9.47)
STORY	28.67	28.68	25.17	27.02
	(10.78)	(10.38)	(7.43)	(10.48)
IMPERATIVES				
PAPER	30.03	34.30	24.02	28.42
	(15.39)	(14.94)	(14.73)	(12.91)
MOD: HIGH				
PAPER	19.32	17.87	18.80	20.02
	(8.38)	(8.69)	(6.58)	(6.99)
STORY	16.95	16.63	18.02	18.83
	(7.73)	(7.67)	(6.46)	(8.13)
MEDIUM				
PAPER	7.18	7.62	8.48	8.83
	(4.35)	(3.76)	(3.65)	(5.46)
STORY	3.43	3.22	3.23	3.58
	(2.61)	(2.60)	(2.51)	(2.64)
LOW				
PAPER	20.43	19.35	17.78	17.50
	(8.68)	(9.02)	(6.57)	(7.10)
STORY	31.18	33.05	22.28	24.47
	(14.33)	(15.13)	(8.15)	(10.47)
PARENT READS				
STORY	10.83	9.95	10.58	10.92
	(5.19)	(4.61)	(3.92)	(3.84)
STRUCTURING: VERBAL TASK				
PAPER	32.12	36.68	29.08	33.15
	(11.92)	(12.19)	(15.16)	(13.85)
NONVERBAL				
PAPER	16.67	15.27	13.78	14.47
	(8.91)	(9.16)	(8.53)	(7.89)
STORY	18.60	19.00	13.22	18.47
	(15.46)	(12.72)	(10.66)	(16.44)
SUPPORT: APPROVAL				
PAPER	15.55	15.78	17.18	17.92
	(6.49)	(8.03)	(5.56)	(5.53)
STORY	10.38	9.72	9.53	10.27
	(5.04)	(5.45)	(4.64)	(4.90)
ATTENTION GETTING				
PAPER	36.42	38.48	31.92	33.77
	(13.80)	(13.14)	(11.50)	(12.33)
STORY	21.72	22.12	15.80	17.25
	(13.33)	(13.42)	(9.81)	(9.96)
NONVERBAL (intrusions)				
PAPER	20.37	20.78	15.82	18.77
	(18.01)	(13.99)	(11.31)	(13.06)

TABLE 7 (CONT'D)

MEANS AND STANDARD DEVIATIONS (SD) FROM GROUP ANALYSES ON PARENT BEHAVIOR VARIABLES

	CH MOTHER N=60	CH FATHER N=60	NCH MOTHER N=60	NCH FATHER N=60
CHILD ENGAGEMENT: ACTIVE				
PAPER	59.32	61.85	60.85	65.67
	(16.42)	(16.74)	(13.25)	(13.84)
STORY	42.10	40.70	38.03	40.60
	(13.62)	(14.80)	(8.60)	(12.81)
PASSIVE				
PAPER	15.50	15.40	15.05	14.98
	(7.21)	(7.81)	(7.37)	(8.88)
STORY	21.58	23.48	21.30	22.77
	(8.75)	(10.45)	(8.53)	(8.27)
SUM OF RATINGS OF CHILD PERFORM				
PAPER	10.18	9.40	13.13	11.70
	(4.94)	(5.22)	(4.41)	(4.70)
PROPORTION SCORE OF RATINGS				
PAPER	5.55	5.22	5.77	5.50
	(0.77)	(1.46)	(0.62)	(0.98)
READING BY PARENT IN SECONDS				
STORY	71.68	67.58	88.53	81.95
	(27.25)	(33.34)	(25.41)	(30.36)
INTERACTION LENGTH:				
TOTAL TIME IN SECONDS				
PAPER	353.03	353.90	309.87	335.33
	(138.10)	(106.63)	(34.83)	(77.30)
STORY	364.68	399.35	333.22	355.18
	(109.64)	(158.38)	(63.46)	(99.15)
TASK TIME				
PAPER	286.57	291.85	231.75	260.67
	(173.55)	(150.58)	(85.09)	(126.26)
STORY	335.50	377.65	297.37	330.05
	(134.51)	(176.44)	(93.72)	(118.31)
NUMBER OF INTERACTIONS				
PAPER	89.27	89.92	83.48	89.10
	(18.18)	(18.52)	(19.01)	(17.76)
STORY	74.80	74.28	65.65	68.87
	(19.85)	(19.07)	(14.95)	(17.55)
PARENT: WARMTH				
PAPER	2.25	1.83	2.18	2.07
	(0.63)	(0.67)	(0.60)	(0.69)
STORY	2.18	1.93	2.18	2.05
	(0.60)	(0.73)	(0.65)	(0.70)
SENSITIVITY				
PAPER	1.97	1.70	2.18	2.03
	(0.74)	(0.70)	(0.60)	(0.69)
STORY	2.20	1.92	2.33	2.15
	(0.58)	(0.67)	(0.63)	(0.68)

of use of particular behaviors was similar for all groups. For example, rank-order correlations between mothers and fathers of each group on most frequently used to least frequently used teaching strategies yielded these results: paper task--CH rho = .98, NCH rho = .94; story task--CH rho = 1.00, NCH rho = .97. Thus, we can conclude that the frequency of use of teaching strategies was relatively similar within each parent group for each task irrespective of the handicap of their child.

Rank-ordering of parent behaviors, however, does not take into account the magnitude of frequency differences. We did find, however, that parents differed in the frequency with which certain behaviors were used.

Differences between CH and NCH groups were analyzed using three-way MANCOVAs (CH vs. NCH group x parent sex x task) on parent teaching behaviors covarying demographic variables (see Table 8). Since some parent behaviors occurred only on the paper task, two-way MANCOVAs were performed on these (see Table 9). Parents of CH children used low level demands to represent more frequently than parents of NCH children, whereas parents of NCH children used more medium level demands. Differences between the parents of the NCH and CH children were also found in the use of nonverbal task structuring, e.g., pointing, with parents of CH children using these strategies more often. Getting and keeping children on task (attention-getting) characterized parents of CH children in contrast to parents of NCH children. Other differences between these two groups of parents were found: Parents of CH children who took longer to accomplish the task evidenced more interactive behaviors, interacted longer in general, were less sensitive to the child's mood and ability levels, and used more imperatives on the paper-folding tasks. NCH children were more independent in their performance on the paper-folding task and also more successful in accomplishing the task. Parents of NCH children spent more time reading during the story-telling task than parents of CH children.

While the above results refer to groups of parents, we also analyzed sex differences between the parents. Mothers and fathers differed in their teaching behaviors. Fathers took longer to accomplish the tasks and had longer interactions with their children. Further, fathers used more imperatives than mothers, especially on the paper-folding task. Mothers were rated as warmer and more sensitive than fathers.

In previous research (Sigel, 1982), we found that parents' teaching strategies were in part a function of the tasks involved. For this reason we examined performance differences as a function of the task in this study.

3a. Parent behavior as a function of task: In Table 8 are presented the results of the MANCOVAs comparing teaching strategies as a function of the task. Parents used statements more often on the paper-folding task than on the story-telling task, but used questions more often with the story-telling task. High and medium level mental operational demands (MOD) to represent were used more often on the paper-folding task than during the story-telling task, but low level demands were used more often during the story-telling task than during the paper-folding task.

TABLE 8

Significant Main and Interaction Effects from 2 x 2 x 2 (CH vs. NCH Group x Parent Sex x Task) MANCOVAs on Parent Behaviors[a]

Dependent Variables	Main Effect	Main Effect Variable	Main Effect Variable Means[b] Mean	Interaction	Interaction Effect Variable	Interaction Effect Variable Means Mean
	F(1,473)					
Form: Statement	Task	Paper	100.76			
	67.31***	Story	76.27			
				F(1,470)		
Question	Task	Paper	97.53	Group x Task	CH/Paper	47.83
	11.01***	Story	109.54	3.80**	CH/Story	57.35
					NCH/Paper	49.70
					NCH/Story	52.19
MOD: HI	Task	Paper	76.01			
	4.09**	Story	70.43			
MED	Task	Paper	32.11			
	206.95***	Story	13.46			
	Group	CH	21.45			
	5.38**	NCH	24.12			
LO	Task	Paper	75.06	Group x Task	CH/Paper	39.78
	88.03***	Story	110.98	11.77***	CH/Story	64.23
	Group	CH	104.01		NCH/Paper	35.28
	33.66***	NCH	82.03		NCH/Story	46.75
Approval	F(1,470)	Paper	66.43	F(1,467)	CH/Paper	31.33
	Task	Story	39.90	Group x Task	CH/Story	20.10
	157.58***			3.80**	NCH/Paper	35.10
					NCH/Story	19.80
Nonverbal task structuring	Task	Paper	60.19			
	4.65**	Story	69.29			
	Group	CH	69.54			
	4.42**	NCH	59.94			
Cohesion (attention getting)	Task	Paper	140.59			
	202.24***	Story	76.89			
	Group	CH	118.74			
	18.20***	NCH	98.74			
Engagement of child:	F(1,474)					
Active	Task	Paper	247.69			
	292.18***	Story	161.43			
Passive	Task	Paper	60.93			
	84.22***	Story	89.13			
Interaction length:	F(1,470)					
Total time in seconds	Task	Paper	1,352.13			
	6.91***	Story	1,452.43			
	Group	CH	1,470.96			
	11.54***	NCH	1,333.60			
	Parent sex	Mother	680.40			
	6.47***	Father	721.89			
Task time	Task	Paper	1,070.84			
	30.60***	Story	1,340.57			
	Group	CH	1,291.57			
	10.77***	NCH	1,119.84			
	Parent sex	Mother	575.59			
	6.36***	Father	630.11			
# of interactions	Task	Paper	351.77			
	104.56***	Story	283.60			
	Group	CH	328.27			
	9.88***	NCH	307.10			
Parent: Warmth	F(1,469)					
	Parent sex	Mother	4.40			
	12.91***	Father	3.94			
Sensitivity	Task	Paper	7.88			
	9.28***	Story	8.60			
	Group	CH	7.79			
	14.82***	NCH	8.69			
	Parent sex	Mother	4.35			
	12.06***	Father	3.90			

[a]Other variables not listed here yielded no significant effects. Covariates in these analyses were demographic variables, i.e. mothers' education, fathers' education, mothers' age, fathers' age, fathers' income, number of children in family, birth order

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$. **$p \leq .05$. ***$p \leq .01$.

TABLE 9

Significant Main Effects from 2 x 2 [Group (CH vs. NCH) x Parent sex] MANCOVAs on Parent Behaviors on the Paper Task or Story Task[a]

Dependent Variables	Main Effect	Main Effect Variable	Variable Means
PAPER TASK			
Imperative	F(1,235)	CH	64.33
	Group - 10.11***	NCH	52.44
	Parent sex - 5.70**	Mother	54.05
		Father	62.72
Verbal task structuring	Group - 3.36*	CH	68.80
		NCH	62.23
	Parent sex - 6.61***	Mother	61.20
		Father	69.83
Approval	Group - 4.42**	CH	31.33
		NCH	35.10
Cohesion (attention getting)	Group - 6.12***	CH	74.90
		NCH	65.69
Rate-sum (summation of child's performance ratings)	Group - 16.85***	CH	19.58
		NCH	24.83
	Parent sex - 3.18*	Mother	23.31
		Father	21.10
STORY TASK			
Reading by parent (in seconds)	Group - 16.84***	CH	139.26
		NCH	170.48

[a]Other variables not listed here yielded no significant effects. Covariates were demographic variables, i.e. mothers' education, fathers' education, fathers' income, sex of child, mothers' age.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$ **$p \leq .05$ ***$p \leq .01$

When we looked at differences between fathers and mothers on each of the tasks, we found that fathers evidenced more verbal task structuring than mothers during the paper-folding task (see Table 9). Verbal task structuring occurred infrequently on the story-telling task, therefore was only analyzed for the paper task.

Finally, we found group x task (CH vs. NCH) interactions in our analyses (see Table 8). Parents of CH children used more low level demands and more questions on the story task than parents of NCH children; whereas parents of NCH children used more approvals than parents of CH children on the paper-folding task. Parents of NCH children, however, used more questions on the paper-folding task than parents of CH children.

The different strategies parents used may be a function of the children's involvement in the task. Children generally were more actively engaged in the paper-folding task, while passive engagement characterized children's performance on the story-telling task (see Table 8).

3b. Comparison of CH and NCH children's performance on the cognitive tasks: While the previously presented analyses showed differences in parent behaviors as a function of the task and handicap of the child, there is reason to believe that the parents' teaching strategies were also influenced by the children's ability level. Therefore, before proceeding to examine the relationship between parental teaching strategies and children's representational ability, let us examine if, and what kinds of, cognitive ability levels appeared among the two groups of children. Are there, for example, differences in cognitive ability between the CH and NCH groups?

Children's scores on each of the cognitive tasks were compared using analysis of covariance. The $\bar{X}$ scores and results of the analyses are presented in Table 10. On each of the cognitive tasks the NCH children scored significantly higher than the CH children. Thus, it can be concluded that, in fact, the CH children were less able to deal with representational and IQ tasks.

A measure of degree of linearity for the mental rotation task was computed from a reaction time score for each subject using the Fisher Z-transformation of the multiple correlation from the polynomial regression of mean reaction time on degree of rotation (and square of rotation). A repeated measures analysis was performed on this mean reaction time transformation to test for a linear trend difference between the CH and NCH groups. No group differences were found. The same analysis was performed on the transformed error (arc-sine transformation on proportion of errors at each rotation) score with the same results. No group differences were found here also. This showed that the CH children were able to perform this task as well as the NCH children, indicating the skills needed for this task were not limited by the children's handicap. It should be noted that a linear trend in mean reaction time was found for the CH and the NCH groups combined indicating that as the Teddy bear was rotated further from 0°, the children took longer to react [$F(1,69) = 45.58$, $p < .01$]. A linear trend was also found for the error score for both groups combined which means that the further from the 0° rotation, the more errors [$F(1,69) = 22.99$, $p < .01$].

TABLE 10

Significant Main Effects Obtained from a 2 x 2 [Group (CH vs. NCH) x Target sex] MANCOVA on Cognitive Variables[a]

Dependent Variables	Main Effect - F(1,111)	Main Effect Variable Means[b] CH	NCH
Anticipatory Imagery	Group - 8.97***	7.98	9.78
Memory for Sequencing of Unfamiliar Geometric Forms	Group - 13.30***	16.70	22.72
Memory for Sequencing of Familiar Pictures	Group - 16.50***	23.68	32.12
Seriation of Pictures	Group - 8.67***	2.57	3.47
Memory of Sentences	Group - 13.01***	10.80	14.63
Simon	Group - 11.95***	1.70	2.58
Verbal IQ on WPPSI	Group - 39.43***	95.60	116.42
Performance IQ on WPPSI	Group - 21.83***	98.47	116.25

[a]Covariates: Target age, birthorder, number of children in family, mothers' education, fathers' income.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$ **$p \leq .05$ ***$p \leq .01$

Finally, when controlling for target age, there was no group by rotation difference in errors.

Suspecting that there was more variability in the performance of the CH children than NCH children, the F_{max} test for homogeneity of variance was performed on each of the cognitive measures except for the mental rotation task (see Table 11). The CH children were found to be more variable than NCH children in performance on the anticipatory imagery task and each of the WPPSI IQ measures. However, on all of the memory tasks and the seriation task, no significant variance differences were found. These results lead to the conclusion that the performance level was lower for the CH children but not necessarily more variable than the performance of NCH children.

However, in view of the significant variability found among the CH children on the IQ measures, we investigated further the role of the children's representational ability using the WPPSI verbal IQ score. This investigation would determine whether parents were reacting differently to children who scored higher versus those who scored lower on the WPPSI verbal IQ measure, resulting in an evaluation of the effect of children's ability level on parental behavior. The discussion of these results will occur later in the report (see pp. 73-75).

4. The relationship between parental beliefs and parental use of distancing strategies: From our constructivist perspective, we reasoned that parental use of distancing strategies would express parental beliefs regarding how children learn and develop cognitively. Specifically, we would expect that parents with the belief that children are self-regulating, developing organisms who acquire knowledge through experimentation would engage their children in a teaching-learning task using high mental operational demands and would use inquiry as a teaching strategy. In contrast, parents who construe children as relatively passive recipients of parental directives and as having a knowledge base that is a product of assimilation and accumulation would use directives or low level distancing strategies, thereby creating few opportunities for the child to problem solve. In essence, the latter type parental behaviors minimize children's autonomy.

Correlational analyses were performed for each of the subsamples of parents between beliefs as determined in the interview and parental distancing strategies employed in each of the two teaching tasks--paper-folding and story-telling. The array of significant correlations is presented in Tables 12 and 13. As can be seen, by inspecting these tables for each task, there is no striking consistent pattern of results.

First, let us attend to the correlational analyses of parental beliefs with distancing strategies in the paper-folding task (see Table 12). Parental use of high level cognitive demands correlated positively with parental beliefs in self-regulation as a developmental principle. However, this relationship was obtained only for mothers of NCH children. The only other positive correlation found between beliefs and the use of high MODs was with

TABLE 11

Results of F_{max} Test for Homogeneity of Variance in Cognitive Assessments

Cognitive Assessment	Standard Deviations		
	CH	NCH	$F_{max}(2,60)$
Anticipatory Imagery	3.89	2.55	2.33***
Memory for Sequencing of Unfamiliar Geometric Forms	11.61	9.95	1.36
Memory for Sequencing of Familiar Pictures	13.85	12.84	1.16
Seriation of Pictures	2.07	1.74	1.42
Memory for Sentences	7.55	6.51	1.35
Simon	1.45	1.68	1.34
WPPSI: Verbal IQ	22.27	13.96	2.54***
Performance IQ	24.82	15.28	2.64***
Full IQ	24.93	14.36	3.01***

***$p = .01$ [$F_{max\ .99}(2,60) = 1.96$].

TABLE 12

SIGNIFICANT CORRELATIONS BETWEEN PARENTAL BELIEFS AND PARENTAL TEACHING STRATEGIES ON THE PAPER TASK [a]

PARENTAL BELIEFS	MOD HI	MOD MED	MOD LO	STRUC-TURING	STATE-MENTS	IMPER-ATIVES	QUESTIONS	APPROVAL	NONVERBAL STRUCTURING	NONVERBAL INTRUSIONS	ATTENTION GETTING
ACCUMULATION											
CH - MOTHER								-.25			
FATHER											
NCH - MOTHER			.24								
FATHER											
COGNITIVE PROCESSES											
CH - MOTHER		.27									
FATHER											
NCH - MOTHER				-.31		-.24			-.26		
FATHER											
DIRECT INSTRUCTION											
CH - MOTHER											
FATHER						.26					
NCH - MOTHER	-.29						-.28			-.24	
FATHER			.32								
EXPERIMENTATION											
CH - MOTHER											
FATHER		-.26						.40	-.29	.30	-.27
NCH - MOTHER											
FATHER		.32		-.28							-.29
EXPOSURE											
CH - MOTHER	.25										
FATHER					.26						
NCH - MOTHER	.33						.26				
FATHER											
MANIPULATE ENVIRONMENT											
CH - MOTHER										.36	.25
FATHER	-.24										-.26
NCH - MOTHER											
FATHER					-.31						-.27
NEGATIVE FEEDBACK											
CH - MOTHER											
FATHER											
NCH - MOTHER				.29		.29					.27
FATHER				-.25		-.32					
POSITIVE FEEDBACK											
CH - MOTHER					.24						
FATHER											
NCH - MOTHER			.24								
FATHER										-.27	
SELF-REGULATION											
CH - MOTHER											
FATHER											
NCH - MOTHER	.27						.27	.25			
FATHER									-.24	.28	
ACTIVE-PASSIVE SUM											
CH - MOTHER				-.25							
FATHER								.26	-.29		
NCH - MOTHER						-.24					
FATHER											

[a] N=60 MOTHERS AND 60 FATHERS IN EACH GROUP. THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .25$, $p < .05$.

TABLE 13

SIGNIFICANT CORRELATIONS BETWEEN PARENTAL BELIEFS AND PARENTAL TEACHING STRATEGIES ON THE STORY TASK[a]

PARENTAL BELIEFS	MOD HI	MOD MED	MOD LO	STATE-MENTS	QUESTIONS	APPROVAL	NONVERBAL STRUCTURING	ATTENTION GETTING
ACCUMULATION								
CH - MOTHER								
FATHER								
NCH - MOTHER								
FATHER			-.29					
COGNITIVE PROCESSES								
CH - MOTHER								
FATHER				.25				
NCH - MOTHER								
FATHER	.24					.33		
DIRECT INSTRUCTION								
CH - MOTHER								
FATHER				-.33				
NCH - MOTHER								
FATHER								
EXPERIMENTATION								
CH - MOTHER		.33						
FATHER						.31		
NCH - MOTHER								
FATHER								
EXPOSURE								
CH - MOTHER								
FATHER	.32							
NCH - MOTHER				-.26				
FATHER								
MANIPULATE ENVIRONMENT								
CH - MOTHER								
FATHER								
NCH - MOTHER								
FATHER				-.37		-.28		-.26
NEGATIVE FEEDBACK								
CH - MOTHER					.28			.25
FATHER								
NCH - MOTHER			.33	.33				.29
FATHER					.28			
POSITIVE FEEDBACK								
CH - MOTHER								.32
FATHER								
NCH - MOTHER								
FATHER	.26							
SELF-REGULATION								
CH - MOTHER								
FATHER	.36			.25				
NCH - MOTHER								
FATHER								
ACTIVE-PASSIVE SUM								
CH - MOTHER					-.24			
FATHER								
NCH - MOTHER								
FATHER	.24							

[a] N=60 MOTHERS AND 60 FATHERS IN EACH GROUP. THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .25$, $p < .05$.

the belief in children learning from exposure to environmental opportunities. This relationship was found only for the NCH group mothers and the CH group mothers.

Fathers of NCH children who held that children learn through experimentation used medium MODs. Mothers of CH children who held that children learn through cognitive processing also used medium MODs. The belief that children learn through the accumulation of knowledge approached significance when correlated with the use of low MODs by NCH group mothers, while fathers of NCH children who used low MODs believed that direct instruction causes children to learn. The NCH group mothers' use of questions correlated with beliefs in exposure and self-regulation. It is interesting to note that these are the same beliefs that correlated with high MODs for NCH mothers. For this same set of mothers, their use of approvals also correlated with self-regulation. Each of these findings is, in general, consistent with our expectations, but, we expected such correlations for each group of parents.

The significant results of the correlational analyses between beliefs and behaviors on the story-telling task are presented in Table 13. It will be recalled that not all the distancing strategies identified in the paper-folding task occurred in the story-telling task. As with the paper-folding task, significant correlations were found as predicted, but varied with the sub-sample of parents. But, as we shall see, some contradictions occurred also. Fathers of CH children, for example, who used high MODs, believed that children's cognitive growth occurs through self-regulatory mechanisms, but they also believed that children assimilate knowledge through exposure to objects and events. Mothers of CH children who held that children acquire knowledge through experimentation used medium MODs.

Use of low MODs related negatively to beliefs in children's capability to employ such cognitive processes as inference and judgment for NCH group fathers. These fathers also produced a negative correlation between the use of low MODs and belief in learning through accumulation of knowledge. Mothers of NCH children used low MODs while believing in negative feedback as a developmental principle accounting for children's cognitive development. The use of questions produced two significant correlations with the belief in negative feedback, one for NCH group fathers and the other for CH group mothers. These results were not predicted.

Turning now to parent teaching strategies which are non-distancing, we find some consistent, predictable trends with the paper-folding task, but they are contingent on the sex of the parents and the pathogenic state of the child. As in the previous discussion pertaining to belief-behavior distancing relationships, the pattern of findings is not highly consistent.

Specifically, examination of Table 12 reveals that structuring on the paper task correlated negatively only for the fathers and mothers of NCH children with those beliefs that can be classed as views of the child as an

active cognizer, i.e., one who learns through active engagement with the environment, such as through Experimentation for NCH group fathers and through the child drawing inferences and making judgments (Cognitive Processes) for NCH group mothers. The correlations between negative feedback from the environment as a source of learning yielded different results for mothers and for fathers of NCH children in that the relationship was positive for mothers and negative for fathers. Mothers of CH children who used structuring tended not to view the child as an active processor of knowledge in general (Active-Passive Sum), although none of the individual beliefs mentioned above correlated significantly with structuring for these mothers.

Thus, we can conclude that while there was some indication of a relationship between parental beliefs and distancing strategies, and also some consistency for the belief-behavior relationship for non-distancing strategies, overall the results were far from satisfactory.

The other non-distancing strategies (imperatives, non-verbal structuring, and attention-getting) produced correlations that fit with our expectations in some cases and not in others (see Table 12). For instance, we predicted that the use of imperatives would correlate negatively with the belief in cognitive processing, but correlate positively with the belief in giving the child direct instruction. For the NCH group mothers on the paper task, the predicted negative relationship of imperatives to cognitive processing was supported but not for the other groups of parents. For the CH group fathers on the paper task, the prediction of a positive relationship between imperatives and direct instruction was supported, but again not with the other parents. Nonverbal structuring on the paper task also produced results consistent with distancing theory in that negative relationships would be expected with cognitive processing, experimentation, self-regulation, and viewing the child as a passive recipient of knowledge. As can be seen from Table 12, each correlation was for a different group of parents. Attention-getting on the paper task was expected to correlate negatively with the belief in learning through experimentation. The correlations for the NCH group fathers and for the CH group fathers was consistent with our expectations but this was not the case for the mothers. We expected attention-getting behaviors to correlate positively with the belief in manipulation of the child's environment, and our expectation was supported for the CH group mothers but not for the CH group fathers. Since all of these behaviors occurred more frequently on the paper task, we will not discuss the results on the story task, although these can be examined in Table 13.

The failure to find consistent relationships between beliefs and behaviors is discouraging. It conjurs up the long-term debates between attitude and behavior. Ironically, the correlations reported here were consistent in part with our hypotheses. However, the same set of relationships did not occur for each sub-sample. Since the reason for the unevenness in the findings may have been due to artifacts such as frequency or distribution of particular beliefs among the groups, we proceeded to reduce the number of beliefs by categorizing them into logical clusters as follows: Cluster I contained beliefs in the child as a recipient of parental or

environmental experience. Beliefs grouped in this cluster were Direct Instruction, Manipulation of Environment, Negative Feedback, and Positive Feedback. Cluster II was of the same genre as Cluster I, but without either of the feedback beliefs since feedback implies reciprocal interaction. Cluster III included Accumulation and Exposure which are beliefs that the child's growth in knowledge occurs through addition, not through internal processes of the child; and Cluster IV included those beliefs (Cognitive Processes, Experimentation, and Self-Regulation) that in their aggregate hold the child to be an active processor of knowledge where experimentation is a mode of relating to the environment. In this last cluster, the child's acquisition of knowledge occurs through internal governing and controlling processes--actually the Piagetian notion of equilibration.

The results of the correlational analysis between the clusters and parent behaviors on the paper-folding task produced almost no significant results or discernible patterns of relationships, therefore these data are not presented.

In summary, correlations between parental beliefs and behaviors were spotty, but revealed some relationships that were consistent with distancing theory. However, as we have said, these varied with the sex of the parent and with the child's pathogenic state. The results are tantalizing for two reasons: First, because there is a theory-based logic for expecting beliefs to act as quasi personal constructs guiding one's behaviors, and second, because there are a number of obtained correlations which are suggestive. Upon reflection, we hypothesized that perhaps parents were reacting to the capabilities of their children, modifying their behaviors but not necessarily their beliefs. The parents of the CH children may have viewed their children as special exceptions to the way they believed normal development proceeded, requiring only different teaching behaviors, not different beliefs. In our concluding section we shall describe in more detail the conceptualization of the belief-behavior relationship which may provide suggestions for future research.

5. Relationship between parental teaching strategies and children's representational competence: We shall present the results of two types of analyses: Pearson product-moment correlations and multiple regression analyses. The correlations describe relationships between each parental teaching strategy on each teaching task and children's performance on each of the representational and IQ tasks. Since in reality children are exposed to both parents, regression analyses will be reported wherein the teaching strategies of mothers and those of fathers were used to predict to children's performances.

Pearson product-moment correlations are presented in Tables 14 and 15. Table 14 shows correlations between parental teaching strategies of mothers and fathers separately on each task and children's scores on the cognitive measures for the NCH group, revealing a relatively consistent trend for mothers and fathers. The use of didactic-controlling strategies (e.g., verbal structuring, nonverbal structuring, attention-getting behaviors,

TABLE 14

CORRELATIONS BETWEEN FREQUENCIES OF PARENTAL TEACHING STRATEGIES AND CHILDREN'S SCORES ON COGNITIVE MEASURES

NCH GROUP (N=60)

PARENT BEHAVIORS	ANTICIPATORY IMAGERY	MEMORY SEQUENCING (PICTURES)	MEMORY SEQUENCING (GEOMETRIC)	SERIATION	MEMORY FOR SENTENCES	SIMON	WPPSI VERBAL	WPPSI PERFORMANCE	WPPSI FULL
MOD: HI									
PAPER - MOTHER	.01	-.08	-.05	-.20	-.08	-.11	-.04	.01	-.02
FATHER	.32*	.18	.18	.18	-.01	-.21	-.02	-.00	-.03
STORY - MOTHER	.06	.08	.06	-.06	-.01	-.19	-.07	.07	-.00
FATHER	.10	.13	.18	-.04	.05	-.03	-.01	.00	-.01
MOD: MED									
PAPER - MOTHER	.04	-.03	.06	-.22	-.20	-.22	.02	-.04	-.01
FATHER	.05	-.15	-.21	-.06	.05	.05	.01	-.13	-.07
STORY - MOTHER	-.11	-.15	-.05	-.24	-.21	-.15	-.15	-.23	-.22
FATHER	.08	-.18	-.14	-.09	-.05	-.14	.06	.14	.12
MOD: LO									
PAPER - MOTHER	-.27*	-.08	-.16	-.24	-.15	-.21	-.09	-.18	-.15
FATHER	-.05	-.12	-.07	.04	.04	-.30*	-.10	-.13	-.13
STORY - MOTHER	.11	-.36*	-.30*	-.27*	-.43*	-.22	-.24	-.16	-.23
FATHER	-.02	-.30*	-.21	-.21	-.30*	-.23	-.33*	-.24	-.32*
STATEMENTS									
PAPER - MOTHER	-.39*	-.20	-.15	-.14	-.30*	-.17	-.07	-.26*	-.18
FATHER	.03	-.11	-.00	.14	-.08	-.12	-.14	-.18	-.19
STORY - MOTHER	.08	-.21	-.11	-.10	-.38*	-.10	-.10	-.09	-.11
FATHER	.06	-.28*	-.24	-.08	-.09	-.14	-.17	-.17	-.19
IMPERATIVES									
PAPER - MOTHER	-.09	-.32*	-.22	-.30*	-.34*	-.21	-.20	-.30*	-.28*
FATHER	-.34*	-.22	-.16	-.28*	-.15	-.30*	-.17	-.22	-.21
VERBAL TASK STRUCTURING									
PAPER - MOTHER	-.14	-.31*	-.27*	-.28*	-.43*	-.21	-.15	-.31*	-.26*
FATHER	-.30*	-.25*	-.17	-.19	-.27*	-.30*	-.23	-.23	-.26*
NONVERBAL STRUCTURING									
PAPER - MOTHER	-.04	-.17	-.05	-.18	-.30*	-.37*	-.11	-.21	-.18
FATHER	-.15	-.16	-.21	-.11	-.02	-.14	-.20	-.20	-.23
STORY - MOTHER	-.03	-.24	-.06	-.06	-.32*	-.22	.02	-.13	-.06
FATHER	-.04	-.50*	-.34*	-.20	-.47*	-.31*	-.30*	-.31*	-.33*
ATTENTION GETTING									
PAPER - MOTHER	-.20	-.39*	-.31*	-.34*	-.41*	-.23	.19	-.41*	-.34*
FATHER	-.05	-.26*	-.18	-.19	-.25*	-.34*	-.25*	-.26*	-.29*
STORY - MOTHER	-.01	-.40*	-.21	-.21	-.38*	-.25*	-.24	-.32*	-.31*
FATHER	-.01	-.18	-.19	-.16	-.25*	-.22	-.14	-.10	-.13
NONVERBAL INTRUSIONS									
PAPER - MOTHER	.04	-.33*	-.16	-.19	-.29*	-.15	-.16	-.16	-.18
FATHER	-.18	-.20	-.33*	-.28*	-.37*	-.25*	-.15	-.27*	-.23

* THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .25$, $p < .05$.

TABLE 15

CORRELATIONS BETWEEN FREQUENCIES OF PARENTAL TEACHING STRATEGIES AND CHILDREN'S SCORES ON COGNITIVE MEASURES

CH GROUP (N=60)

PARENT BEHAVIORS	ANTICIPATORY IMAGERY	MEMORY SEQUENCING (PICTURES)	MEMORY SEQUENCING (GEOMETRIC)	SERIATION	MEMORY FOR SENTENCES	SIMON	WPPSI VERBAL	WPPSI PERFORMANCE	WPPSI FULL
MOD: HI									
PAPER - MOTHER	.30*	.01	.01	.24	.27*	.18	.26*	.24	.27*
FATHER	.17	.08	.05	.15	-.00	.11	.23	.16	.21
STORY - MOTHER	.30*	-.01	-.01	.26*	.11	.12	.29*	.28*	.30*
FATHER	.37*	.19	.03	.39*	.16	.24	.35*	.36*	.37*
MOD: MED									
PAPER - MOTHER	.30*	-.01	-.03	.15	.05	.08	.18	.17	.19
FATHER	.30*	.20	.10	.24	.26*	.24	.37*	.29*	.35*
STORY - MOTHER	-.12	-.38*	-.24	.13	-.21	-.10	-.08	-.14	-.12
FATHER	-.04	-.02	.00	.07	.07	.17	-.03	-.09	-.06
MOD: LO									
PAPER - MOTHER	-.31*	-.35*	-.30*	-.34*	-.34*	-.35*	-.36*	-.38*	-.39*
FATHER	-.09	-.25*	-.20	-.01	-.30*	-.27*	-.25*	-.24	-.25*
STORY - MOTHER	-.51*	-.54*	-.44*	-.44*	-.43*	-.41*	-.51*	-.52*	-.54*
FATHER	-.34*	-.40*	-.29*	-.20	-.39*	-.41*	-.48*	-.43*	-.48*
STATEMENTS									
PAPER - MOTHER	-.03	-.24	-.21	.01	-.02	-.02	-.06	-.16	-.11
FATHER	.22	.10	.10	.24	.15	.11	.30*	.25*	.29*
STORY - MOTHER	-.27*	-.35*	-.23	-.12	-.23	-.18	-.12	-.17	-.15
FATHER	-.11	-.21	-.14	.07	-.08	-.09	.04	-.00	.01
IMPERATIVES									
PAPER - MOTHER	-.36*	-.35*	-.33*	-.31*	-.47*	-.40*	-.53*	-.42*	-.50*
FATHER	-.33*	-.35*	-.25*	-.19	-.33*	-.45*	-.43*	-.38*	-.42*
VERBAL TASK STRUCTURING									
PAPER - MOTHER	-.10	-.19	-.25*	-.21	-.36*	-.30*	-.39*	-.23	-.32*
FATHER	-.10	-.28*	-.12	-.01	-.20	-.30*	-.21	-.16	-.19
NONVERBAL STRUCTURING									
PAPER - MOTHER	-.34*	-.36*	-.34*	-.18	-.30*	-.27*	-.27*	-.24	-.27*
FATHER	-.09	-.15	-.07	.03	-.19	-.03	-.02	-.10	-.06
STORY - MOTHER	-.46*	-.49*	-.38*	-.34*	-.42*	-.34*	-.43*	-.47*	-.48*
FATHER	-.11	-.35*	-.27*	.01	-.24	-.23	-.21	-.17	-.20
ATTENTION GETTING									
PAPER - MOTHER	-.46*	-.58*	-.59*	-.48*	-.53*	-.58*	-.59*	-.58*	-.61*
FATHER	-.45*	-.49*	-.42*	-.30*	-.42*	-.55*	-.42*	-.45*	-.46*
STORY - MOTHER	-.55*	-.63*	-.53*	-.42*	-.53*	-.49*	-.61*	-.62*	-.64*
FATHER	-.47*	-.57*	-.52*	-.29*	-.45*	-.48*	-.54*	-.57*	-.59*
NONVERBAL INTRUSIONS									
PAPER - MOTHER	-.36*	-.31*	-.29*	-.24	-.33*	-.42*	-.42*	-.37*	-.41*
FATHER	-.20	-.12	-.15	-.25*	-.11	-.18	-.16	-.07	-.11

* THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .25$, $p < .05$.

imperatives, statements), related negatively to each of the cognitive measures for each task. As for the distancing strategies (Hi, Med, and Lo MODs), the correlations were less consistent. High mental operational demand strategies related differentially for each task and for each cognitive variable. The trend was for high MODs to have relatively little influence on cognitive function, while low MODs and medium MODs tended to relate negatively to cognitive outcomes. One reason for this set of findings relative to medium or low level strategies was that the use of these MODs may well have been less relevant and hence less demanding than high MODs in the story context. It is of interest to note, however, that for fathers of NCH children, particularly on the paper-folding task, high MODs related significantly to performance on the anticipatory imagery task ($r = .32$, $p < .05$).

The results for the CH group were indeed impressive. High level distancing strategies, irrespective of type of task or parent sex, related positively and significantly to the anticipatory imagery task, seriation, and the WPPSI (see Table 15). While some of the other correlations were not significant, what is important is that with only two exceptions the general trend was consistent. These strategies were not significantly related to our memory tasks (memory for sentences and auditory sequential memory, called Simon), except in one instance (high MODs of mothers of CH on the paper-folding task correlated significantly with memory for sentences). Thus, in summary we can conclude that parents' use of high level distancing strategies while teaching a preschool communication handicapped child related significantly to the child's representational competence and general intellectual ability.

Low and medium MODs, however, tended to yield negative relationships. For the story task, the CH group mothers' use of low MODs and medium MOD's related negatively and more often, significantly, to each of the cognitive measures. Results for the CH group fathers were similar, with the magnitude of some of the correlations being less than for mothers. Negative relationships were also obtained with the use of authoritative strategies.

The findings for the paper-folding task for the CH group were somewhat different. As with the story task, low MODs and medium MODs related to many of the cognitive scores when used by fathers or mothers. Low MODs, as well as the structuring and imperatives used by mothers or by fathers, were consistently negative, and in many instances, significantly correlated with cognitive scores. For mothers and fathers there was a positive significant relationship between medium MODs used on the paper-folding task and performance on the anticipatory imagery task. The fathers' medium MOD strategies on the paper-folding task related positively to other cognitive measures. One reason why medium MOD strategies may have played an important role in this task is because the paper-folding task required sequencing, asymmetrical classifying, and reproducing material from one representational domain to another.

Correlations of the mental rotation task (Teddy) with parental teaching strategies will be presented separately since the results of this complex task require more detailed description. An arc-sine transformation was performed on the proportion of errors made by the children at each rotation. These transformed scores were used as error scores and were correlated with parental behaviors on the story and paper tasks. We predicted that error scores on the mental rotation task would correlate negatively with parental use of high and medium distancing strategies since distancing experience should enhance children's representational skills. Teaching strategies which are nondistancing would be expected to correlate positively with errors since these strategies are held to have little influence on representational competence.

Beginning with the CH group, the correlations presented in Table 16 reveal that the use of high and medium distancing strategies by mothers on the paper task correlated positively with errors made by children at all of the rotations, contradicting our predictions in part. The correlations between distancing behaviors by these mothers on the story task and errors by children did not produce significant results. However, the correlations of nondistancing behaviors (imperatives, attention-getting, nonverbal structuring) of these mothers on both tasks with errors by children were positive. Although the correlations were not always significant, the direction was consistent thereby confirming the nondistancing part of our predictions. The overall results for the CH group mothers are puzzling: Why should distancing behaviors relate positively to error scores while nondistancing behaviors related similarly? No definitive answer is available at this time.

Interestingly enough, for fathers of CH children (see Table 16), the nondistancing behaviors on both tasks correlated with errors similarly to the mothers, but these correlations were not significant on either task. Although these latter correlations were often negative (the predicted direction), the magnitude was too low to be of importance. Therefore, the results obtained with the nondistancing behaviors (verbal structuring, imperatives, nonverbal structuring, attention-getting) of the CH group fathers provided stronger support to that part of our predictions than mothers' behaviors, but the predictions of a negative relationship between distancing behaviors and errors was not supported for these fathers.

The findings for the NCH group are presented in Table 17. Overall, these results were not very strong, plus they were inconsistent with our predictions. For example, on the story task the use of both nonverbal structuring and high MODs by the NCH group mothers produced positive significant correlations with errors by children at some rotations and not at other rotations. As indicated earlier, we would have expected errors to be positively correlated with nonverbal structuring but negatively correlated with high MODs. The results obtained with the NCH group fathers were also inconsistent (see Table 17), supporting the predictions in some correlations and not in

TABLE 16

CORRELATIONS OF ARC-SINE TRANSFORMATIONS OF PROPORTION OF ERRORS ON TEDDY TASK WITH PARENTAL TEACHING STRATEGIES ON PAPER TASK AND STORY TASK

CH GROUP (N=35)

	DEGREE OF ROTATION				
PARENT BEHAVIORS	0	30	60	120	150
MOD: HI					
PAPER - MOTHER	.34*	.15	.40*	.41*	.34*
FATHER	-.11	-.04	-.01	-.05	-.01
STORY - MOTHER	.09	.01	.20	.21	.20
FATHER	.04	-.11	.06	.03	-.04
MOD: MED					
PAPER - MOTHER	.08	.31	.35*	.37*	.24
FATHER	.04	.00	.12	-.03	-.05
STORY - MOTHER	-.10	-.09	.04	.16	-.03
FATHER	-.13	.07	-.01	.08	-.00
MOD: LO					
PAPER - MOTHER	-.12	.22	.21	.35*	-.08
FATHER	.23	.23	.19	.20	.25
STORY - MOTHER	.09	.16	.16	.19	.03
FATHER	.29	.13	.27	.09	.06
STATEMENTS					
PAPER - MOTHER	-.01	-.13	-.06	-.04	-.08
FATHER	.06	.21	.24	.18	.16
STORY - MOTHER	.18	.08	.09	.01	.07
FATHER	.27	.06	.32	-.01	.06
IMPERATIVES					
PAPER - MOTHER	.23	.32	.26	.34*	.18
FATHER	.46*	.50*	.49*	.45*	.54*
VERBAL TASK STRUCTURING					
PAPER - MOTHER	.22	.19	.14	.19	.12
FATHER	.36*	.53*	.55*	.49*	.52*
NONVERBAL STRUCTURING					
PAPER - MOTHER	.31	.32	.42*	.34*	.30
FATHER	.25	.44*	.22	.34*	.24
STORY - MOTHER	.34*	.25	.18	.32	.22
FATHER	.26	.31	.37*	.20	.25
ATTENTION GETTING					
PAPER - MOTHER	.44*	.45*	.36*	.39*	.32
FATHER	.41*	.58*	.49*	.48*	.53*
STORY - MOTHER	.25	.09	.13	.13	.03
FATHER	.49*	.41*	.33*	.29	.21
NONVERBAL INTRUSIONS					
PAPER - MOTHER	.15	.25	.10	.23	.10
FATHER	-.00	.21	.35*	.16	.30
APPROVAL					
PAPER - MOTHER	.10	.19	.33*	.31	.25
FATHER	-.10	-.11	.17	.05	.06
STORY - MOTHER	-.03	.24	.18	.24	.08
FATHER	.13	-.06	.10	-.02	.11

* THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .33$, $p < .05$.

TABLE 17

CORRELATIONS OF ARC-SINE TRANSFORMATIONS OF PROPORTION OF ERRORS ON TEDDY TASK WITH PARENTAL TEACHING STRATEGIES ON PAPER TASK AND STORY TASK

NCH GROUP (N=35)

	DEGREE OF ROTATION				
PARENT BEHAVIORS	0	30	60	120	150
MOD: HI					
PAPER - MOTHER	-.06	.14	.17	.24	.24
FATHER	-.12	-.21	.14	.19	.27
STORY - MOTHER	-.25	.01	.13	.34*	.48*
FATHER	-.14	-.13	.02	.08	.24
MOD: MED					
PAPER - MOTHER	-.12	-.16	-.11	-.08	-.04
FATHER	.12	.05	.09	-.08	.07
STORY - MOTHER	-.12	-.06	-.02	-.12	-.08
FATHER	.03	.04	.02	-.04	.15
MOD: LO					
PAPER - MOTHER	.29	.29	.24	.11	.12
FATHER	.03	-.25	-.24	-.33*	-.27
STORY - MOTHER	.25	.27	.20	.21	.10
FATHER	.18	.43*	.13	.09	.02
STATEMENTS					
PAPER - MOTHER	.06	.01	-.03	.07	.02
FATHER	.04	.06	-.08	-.17	-.13
STORY - MOTHER	.02	.15	.06	.15	.23
FATHER	-.00	.10	.11	.07	.19
IMPERATIVES					
PAPER - MOTHER	.30	.14	-.12	-.07	-.05
FATHER	.27	.16	-.01	.09	-.05
VERBAL TASK STRUCTURING					
PAPER - MOTHER	.13	.11	-.08	.12	-.01
FATHER	.26	.23	.07	.15	-.01
NONVERBAL STRUCTURING					
PAPER - MOTHER	.08	.05	.05	-.01	-.13
FATHER	.21	-.03	.12	.13	.21
STORY - MOTHER	.33*	.11	.22	.28	.07
FATHER	.29	.31	.27	.16	.22
ATTENTION GETTING					
PAPER - MOTHER	.25	.13	-.08	.11	-.04
FATHER	.39*	.38*	.20	.09	-.10
STORY - MOTHER	.17	.32	.18	.22	.25
FATHER	.26	.35*	.16	.13	.13
NONVERBAL INTRUSIONS					
PAPER - MOTHER	.19	.24	.07	.07	-.00
FATHER	-.01	.11	.02	-.08	-.23
APPROVAL					
PAPER - MOTHER	-.41*	-.37*	-.21	-.23	.00
FATHER	-.05	-.09	-.11	-.23	-.21
STORY - MOTHER	-.26	-.18	-.10	-.10	-.04
FATHER	.16	.48*	.10	.18	.15

* THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .33$, $p < .05$.

others. In summary, the results with the mental rotation task for the NCH group did not provide a coherent pattern of findings. Few significant correlations were found, raising the question of whether they occurred by chance. The trends, however, suggest that at least nondistancing behaviors did relate positively to errors made by children at most rotations.

Perhaps the results of both the CH and NCH groups should be considered in terms of the characteristics of the mental rotation task. It is possible that parental teaching behaviors from other situations do not transfer directly to children's performance on this particular task because of the nature of the task. Further research should be conducted in this area.

Multiple regression analyses were conducted in order to investigate relationships between parental teaching behaviors and children's performance on the other cognitive tasks when both mothers' and fathers' behaviors were simultaneously included as predictors to children's cognitive scores. Demographic variables were initially forced into the regression analyses followed by the parent behavior variables which represented a class of variables that have demonstrated in a previous study (Sigel, 1982) predictions to children's representational competence. Results of the regression analyses are presented separately for the two tasks in Tables 18 and 19.

In general, on both the paper and story tasks, the behaviors of mothers of CH children produced the most significant increments in multiple correlation coefficients. It is interesting to note that on the paper task the behaviors of fathers of NCH children produced more significant increments in multiple correlation coefficients than either fathers of CH children or mothers of NCH children. Of further interest is that behaviors of mothers of NCH children produced few significant increments in multiple correlations coefficients on either the paper or story task.

The specific results indicating the relationships between parent behaviors on each task to the children's performance on each of the representational tasks are presented in Tables 18 and 19. On the paper task (see Table 18) within the CH group, the attention-getting behaviors of mothers were negatively related to all of the child assessment variables: children's anticipatory imagery, memory for sequencing of familiar pictures, memory for sequencing of unfamiliar geometric forms, seriation of pictures, memory for sentences, Simon, verbal IQ on the WPPSI, and performance IQ on the WPPSI. In addition, the use of high MODs by these mothers was related positively to children's anticipatory imagery, memory for sentences, and verbal IQ on the WPPSI. Fathers within the CH group evidenced behaviors related only to Simon, negative relationships with both attention-getting behaviors and interaction time with the child.

Within the NCH group performing the paper task (see Table 18) the time the father spent interacting with the child was negatively related to the following: children's memory for sequencing of familiar pictures, verbal IQ on the WPPSI, and performance IQ on the WPPSI. The time the NCH group mothers spent interacting with the child was also negatively related to

TABLE 18

Multiple Correlation Coefficients for Parental Paper-folding Behaviors and Child Assessment Variables

		CH (N=60)		NCH (N=60)
Anticipatory Imagery		R		R
Control variables:				
Target age[b]				
Father income	(-)			
Target sex[a]		.31		.42*
Explanatory variables:				
Attention getting (mother)	(-)	.58		
# High level mental operational demands (mother)		.63		
# Statements (mother)			(-)	.52
# Nonverbal intrusions (mother)				.61
Nonverbal task structuring (father)			(-)	.65
Memory for Sequencing of Familiar Pictures				
Control variables:				
Target age[a,b]		.37*		.59*
Explanatory variables:				
Attention getting (mother)	(-)	.66		
Interaction time with child (father)			(-)	.65
Memory for Sequencing of Unfamiliar Geometric Forms				
Control variables:				
Target age[a,b]				
Father income		.38*		.68*
Explanatory variables:				
Attention getting (mother)	(-)	.68		
Nonverbal task structuring (father)			(-)	.71
Seriation of Pictures				
Control variables:				
Target age[a,b]				
Father income		.43*		.54*
Explanatory variables:				
Attention getting (mother)	(-)	.60		

TABLE 18 (Cont'd)

		CH (N=60) R		NCH (N=60) R
Memory for Sentences				
Control variables:				
Target age[a,b]				
Father income		.45*	(-)	.55*
Explanatory variables:				
Attention getting (mother)	(-)	.67		
# High level mental operational demands (mother)		.70		
Task structuring (mother)			(-)	.61
Interaction time with child (mother)			(-)	.64
SIMON				
Control variables:				
Mother education[a]	(-)			
Target age[a,b]				
Father income[b]		.50*	(-)	.42*
Explanatory variables:				
Attention getting (mother)	(-)	.70		
Attention getting (father)	(-)	.73		
Interaction time with child (father)	(-)	.76		
# High level mental operational demands (father)			(-)	.53
# Imperatives (father)			(-)	.59
Verbal IQ on WPPSI				
Control variables:				
Mother education[a]		.10		.34*
Explanatory variables:				
Attention getting (mother)	(-)	.60		
# High level mental operational demands (mother)		.64		
Interaction time with child (father)			(-)	.44
Attention getting (father)			(-)	.50

TABLE 18 (Cont'd)

Performance IQ on WPPSI		CH (N=60) R		NCH (N=60) R
Control variables:				
Mother education				
Target age[a]		.14		.41*
Explanatory variables:				
Attention getting (mother)	(-)	.59		
Interaction time with child (father)			(-)	.51

Note: All R's for relationships between parent behaviors and child assessments are significant at $p < .05$.

*Indicates p of .05 or less for demographic variables.

(-) Indicates direction of zero-order correlation.

[a]Indicates demographic variable significantly ($p < .05$) contributing to R for NCH sample.

[b]Indicates demographic variable significantly ($p < .05$) contributing to R for CH sample.

TABLE 19

Multiple Correlation Coefficients for Parental Storytelling Behaviors and Child Assessment Variables

		CH (N=60)		NCH (N=60)
Anticipatory Imagery		R		R
Control variables:				
Target age[b]				
Father income	(-)			
Target sex[a]		.31		.42*
Explanatory variables:				
Attention getting (mothers)	(-)	.62		
# High level mental operational demands (mothers)		.70		
# Low level mental operational demands (mothers)	(-)	.73		
Memory for Sequencing of Familiar Pictures				
Control variables:				
Target age[a,b]		.37*		.59*
Explanatory variables:				
Attention getting (fathers)	(-)	.69		
Attention getting (mothers)	(-)	.74		
Nonverbal task structuring (fathers)			(-)	.68
Memory for Sequencing of Unfamiliar Geometric Forms				
Control variables:				
Target age[a,b]				
Father income		.38*		.68*
Explanatory variables:				
Attention getting (fathers)	(-)	.67		
Seriation of Pictures				
Control variables:				
Target age[a,b]				
Father income		.43*		.54*
Explanatory variables:				
#Low level mental operational demands (mothers)	(-)	.57		
# High level mental operational demands (mothers)		.64		

TABLE 19 (Cont'd)

		CH (N=60) R		NCH (N=60) R
Memory for Sentences				
Control variables:				
Target age[a,b]				
Father income		.45*	(-)	.55*
Explanatory variables:				
Attention getting (fathers)	(-)	.66		
Nonverbal task structuring (fathers)			(-)	.64
# Statements (mothers)			(-)	.67
SIMON				
Control variables:				
Mother education[a]	(-)			
Target age[a,b]				
Father income[b]		.50*	(-)	.42*
Explanatory variables:				
Attention getting (fathers)	(-)	.73		
Verbal IQ on WPPSI				
Control variables:				
Mother education[a]		.10		.34*
Explanatory variables:				
Attention getting (mothers)	(-)	.62		
# High level mental operational demands (mothers)		.67		
Attention getting (fathers)	(-)	.70		
# Low level mental operational demands (fathers)			(-)	.45
Interaction time with child (fathers)			(-)	.51

TABLE 19 (Cont'd)

Performance IQ on WPPSI		CH (N=60) R	NCH (N=60) R
Control variables:			
Mother education			
Target age[a]		.14	.41*
Explanatory variables:			
Attention getting (mothers)	(-)	.62	
# High level mental operational demands (fathers)		.67	
Attention getting (fathers)	(-)	.71	

Note: All R's for relationships between parent behaviors and child assessments are significant at $p < .05$.

*Indicates p of .05 or less for demographic variables.

(-) Indicates direction of zero-order correlation.

[a]Indicates demographic variable significantly ($p < .05$) contributing to R for NCH sample.

[b]Indicates demographic variable significantly ($p < .05$) contributing to R for CH sample.

memory for sentences. Fathers' nonverbal structuring was negatively related to children's anticipatory imagery and memory for sequencing of unfamiliar geometric forms whereas mothers' verbal task structuring was negatively related to children's memory for sentences. Mothers' use of statements was negatively related to children's anticipatory imagery while fathers' use of imperatives and Hi MODs was negatively related to children's performance on Simon. Fathers' use of attention-getting strategies was negatively related to children's verbal IQ on the WPPSI. Finally, mothers' use of nonverbal intrusions was related positively to children's anticipatory imagery. It is interesting to note that all of the relationships within the NCH group were negative with the exception of mothers' use of nonverbal intrusions.

On the story task (see Table 19) within the CH group, the attention-getting behaviors of both parents were negatively related to all of the child assessment variables, except children's seriation of pictures: children's anticipatory imagery for mothers' behaviors, memory for sequencing of familiar pictures for both mothers' and fathers' behaviors, memory for sequencing of unfamiliar geometric forms for fathers' behaviors, memory for sentences for fathers' behaviors, Simon for fathers' behaviors, verbal IQ on WPPSI for both mothers' and fathers' behaviors, and performance IQ on WPPSI for both mothers' and fathers' behaviors. Mothers' use of high MODs was related positively to children's anticipatory imagery, seriation of pictures, and verbal IQ on WPPSI whereas fathers' use of high MODs was related positively to children's performance IQ on the WPPSI. Mothers' use of low MODs was negatively related to children's anticipatory imagery and seriation of pictures.

Within the NCH group on the story task (see Table 19), fathers' use of nonverbal structuring was negatively related to children's memory for sequencing of familiar pictures and memory for sentences. Also, fathers' use of low MODs and fathers' interaction time (time spent with child performing the task) were negatively related to verbal IQ on the WPPSI. The only relationship for mothers was for their use of statements, which was negatively related to children's memory for sentences. Again, all of the relationships within the NCH group were negative.

To summarize, it appears that mothers of CH children played the primary role in influencing their children's representational competence while fathers of NCH children had a similar influence. Irrespective of task, the CH children's parents' use of attention-getting strategies predicted to lower child performance on the majority of the cognitive tasks. It should be mentioned that within the CH group there was considerable variability in the severity of the handicap of the child, which could cause the parents of the more severe children to exhibit different behaviors, but also the degree of severity could be related to the performance of the child. If the parent was reacting appropriately to the child's level of ability, with the more severely handicapped child, the parent may have used a variety of strategies trying to get and/or maintain the child's attention to the task as well as using low level mental operational demands such as labeling or describing while at the same time this type of child was not able to perform well on the cognitive tasks.

This would indicate that the child's ability level was causing the parent to behave in certain ways. At the other end of the extreme, where the child is less severely handicapped and therefore probably performed better on the cognitive tasks, the parent (still responding to the ability level of the child) may have considered it appropriate to use high level mental operational demands such as planning or inferring cause-effect relationships. This variability within the groups is most probably related to the variability of the parents' use of high level mental operational demands.

Within the NCH group the children were bright (mean WPPSI IQ on verbal and performance measures = 116) and had no handicaps which may account for less variability in the parents' use of high level mental operational demands (they probably all used them, reacting appropriately to the child's ability level). Also, within this group there may have been more variability in parents' use of low level mental operational demands and various structuring behaviors (verbal and nonverbal) in reacting to the children's ability level since these children were capable of responding to a variety of behaviors as well as being capable of handling the task without the parent maintaining the structure of the task. In all of the relationships with parents' use of low level mental operational demands, verbal task structuring, nonverbal structuring, use of statements, and use of imperatives, the prediction was to lower performance of the child on the assessment tasks. These findings are consistent with predictions based on distancing theory that deal with low level demands, structuring, statements and imperatives in that all of these should be negatively related to children's performance levels.

It is possible that some of the reported correlations were a function of the variability among each of the parent sub-samples. A high degree of variability would suggest considerable individual differences among the parent groups in their use of a particular teaching strategy. To test for this variability the F_{max} test for homogeneity of variance was performed on parental use of teaching strategies from each of the two tasks. The results are presented in Table 20 for the paper task and Table 21 for the story task in terms of comparisons between the standard deviations of two subgroups of parents.

When comparing mothers and fathers of CH children on the paper task (see Table 20), only total time yielded a significant difference in variance with the mothers being more variable than the fathers. Then mothers of NCH children were compared with fathers of NCH children, fathers were significantly more variable than mothers in the use of medium MODs, total time, and time to complete the task.

The results on the story task (see Table 21) were similar to those on the paper task. For CH group parents, total time and time to complete the task yielded significant differences in variance with the father being more variable than the mother in each comparison. For NCH group parents significant differences in variance were found in their use of questions, nonverbal structuring, and total time, with fathers being more variable than mothers in all three comparisons.

TABLE 20

Results of F_{max} Test for Homogeneity of Variance in Parent Paperfolding Behaviors[a]

Parent Behaviors	Standard Deviations				
	CH Mother	CH Father	NCH Mother	NCH Father	$F_{max}(2,60)$
MOD HI	8.38		6.58		1.62*
		8.69		6.99	1.55*
MOD MED	4.35	3.76			1.34
			3.65	5.46	2.24***
	4.35		3.65		1.42
		3.76		5.46	2.11***
MOD LO	8.68		6.57		1.74**
		9.02		7.10	1.61*
Task structuring	11.92		15.16		1.62*
		12.19		13.85	1.29
Approval	6.49	8.03			1.53*
			5.56	5.53	1.01
	6.49		5.56		1.36
		8.03		5.53	2.11***
Nonverbal intrusion	18.01	13.99			1.66*
			11.31	13.06	1.33
	18.01		11.31		2.54***
		13.99		13.06	1.15
Cohesion	13.80		11.50		1.44
(attention getting)		13.14		12.33	1.14
Total time in seconds	138.10	106.63			1.68**
			34.83	77.30	4.93***
	138.10		34.83		15.72***
		106.63		77.30	1.90**
Time to complete task	173.55	150.58			1.33
			85.09	126.26	2.20***
	173.55		85.09		4.16***
		150.58		126.26	1.42

[a]Other behaviors not listed here yielded no significant differences in variance.

*Approaches $p = .05$ [$F_{max.95}(2,60) = 1.67$]. **$p = .05$. ***$p = .01$.

TABLE 21

Results of F_{max} Test for Homogeneity of Variance in Parent Storytelling Behaviors[a]

Parent Behaviors	Standard Deviations				
	CH Mother	CH Father	NCH Mother	NCH Father	$F_{max}(2,60)$
MOD HI	7.73	7.67			1.02
			6.46	8.13	1.58*
MOD LO	14.33	15.13			1.11
			8.15	10.47	1.65*
	14.33		8.15		3.09***
		15.13		10.47	2.09***
Question	10.78	10.38			1.08
			7.43	10.48	1.99***
	10.78		7.43		2.11***
		10.38		10.48	1.02
Nonverbal structuring	15.46	12.72			1.48
			10.66	16.44	2.38***
	15.46		10.66		2.10***
		12.72		16.44	1.67**
Cohesion	13.33	13.42			1.01
(attention getting)			9.81	9.96	1.03
	13.33		9.81		1.85**
		13.42		9.96	1.82**
Child engagement: Active	13.62	14.80			1.18
			8.60	12.81	2.22***
	13.62		8.60		2.51***
		14.80		12.81	1.33
Passive	8.75		8.53		1.05
		10.45		8.27	1.60*
Total time in seconds	109.64	158.38			2.09***
			63.46	99.15	2.44***
	109.64		63.46		2.98***
		158.38		99.15	2.55***
Time to complete task	134.51	176.44			1.72**
			93.72	118.31	1.59*
	134.51		93.72		2.06***
		176.44		118.31	2.22***
Total # of interactions	19.85		14.95		1.76**
		19.07		17.55	1.18

[a]Other behaviors not listed here yielded no significant differences in variance.

*Approaches $p = .05$ [$F_{max\ .95}(2,60) = 1.67$]. **$p = .05$. ***$p = .01$.

Comparisons between mothers (CH versus NCH) and between fathers (CH versus NCH) are available in Tables 20 and 21. Careful inspection of the standard deviations in both tables will reveal a tendency for the NCH group mothers to be the least variable (except in their use of verbal task structuring on the paper task where they were the most variable) even though the tests for differences in variance were not significant for all of the comparisons. The tables also show that no single group of mothers or fathers was consistently the most variable in their use of the teaching strategies. Scanning the standard deviations in both tables reveals a tendency for the parents of CH children to be more variable than the parents of NCH children although no comparisons were computed between the groups when combining mothers and fathers.

To summarize, these results indicate that the variability in parental use of distancing strategies and nondistancing strategies can be useful in interpreting the correlations and analyses of variance presented in this report.

Returning to the regression analyses, within the CH group the parents' use of high level mental operational demands was positively related to children's performance on some of the assessment tasks while low level mental operational demands were negatively related to children's performance (see Tables 18 and 19). These findings also support the predictions based on distancing theory, i.e., low level demands should be negatively related to (and high level demands should be positively related to) children's performance levels.

To clarify the negative relationships of interaction time with the various child assessments we interpret these results as a function of the children's competence, that is, the more competent the child, the faster the child finished the task and hence received a lower score on interaction time.

In general, the predictions of distancing theory have been supported in part by the following findings: (1) high level mental operational demands predicted to high child performance on some of the child assessments; (2) low level mental operational demands predicted to low child performance on some of the child assessments; (3) use of statements or imperatives predicted to low child performance on some of the tasks; (4) structuring (nonverbal and verbal) behaviors predicted to low child performance on some tasks; and (5) attention-getting behaviors predicted to low child performance on several tasks. The use of low level demands by parents of all the children was negatively related with children's performance whereas the use of high level demands was positively related primarily to the handicapped children's performance.

6. The relationship of children's competence on the paper-folding task to parental teaching strategies, to children's performance on the cognitive tasks, and to parental beliefs: In the previous analyses we have shown that parental beliefs did not predict consistently with parental use of distancing

strategies. But we did find that parental distancing strategies did relate to children's representational and intellectual performance. In each of these analyses, however, we did not examine the relationship between the parents' teaching strategies and the children's performance on either the paper-folding task or on the story-reading task. Rather, we have assumed that the teaching behavior of the parent as expressed in our laboratory situation, was a sample of their teaching behavior in general. Further, we have argued that the effect of these teaching strategies could be found by independent assessment of the child's cognitive competence. In effect, our measures were distal measures of children's cognitive ability. At issue then is to identify a proximal test between the parents' use of distancing strategies and the children's performance.

The rationale for the interest in the proximal performance was twofold: the quality of this interaction may be representative of how parents "teach their children" thereby providing an explanatory basis for obtained relationships with distal variables whereas the in vivo observation provided a contemporary view of the quality of the interaction between parents and their children.

To accomplish these goals we focused on the parent-child interaction with the paper-folding task because this task demanded employment of representational thinking processes which were congruent with our conceptualization of representational thought. To complete the task successfully the child had to inspect the model, transform the observed vertically presented steps in the model to the horizontal, and follow each step in sequence. Unless this was done, the child could not complete the task. Thus, the child had to analyze component parts and restructure them into coherent wholes. The child had only blank sheets of 8-1/2 x 8-1/2 paper available which in their wholeness did not resemble any part of the models to be followed. Thus, the child was in part involved in performing a task which required representational competence.

From our perspective, the paper-folding task allowed for an array of teaching strategies which could tap into such processes as planning, visualization of three-dimensions, etc. How the parent provided the child with the opportunity to employ these processes through the use of particular strategies was an open question. To illustrate this point more clearly, let us point out that each parent had a choice as to what and how to teach the child each step. Thus, the parent could begin by defining the task or by asking the child what he/she thinks the task is, or the parent could model and ask the child to watch and copy. Any one or more of these approaches was possible. Essentially, our view was that whatever approach the parent used would be characteristic of that parent.

Before we proceed to present our findings relating child performance on the paper-folding task and parental teaching strategies, let us first determine the relationship between the child's competence on the paper task and performance on the cognitive tasks. In effect, this analysis can be considered to be a validation of our conceptual analysis of the paper-folding task.

Competence on the paper-folding task was determined by an observer who evaluated the child's performance on a four-point scale ranging from "0" where the child failed (needed much help to complete the step) to "3" where the child completed the step without needing outside help. This rating was done for each of six steps. Thus, a child could get a score from 0-18 (called summation of ratings). These ratings were correlated with each of the cognitive and intelligence measures. The results are presented in Table 22 for each sample, i.e., fathers and mothers with their CH and NCH children.

It is clear from Table 22 that most correlations between child performance on the paper-folding task and the cognitive measures were positive and significant. Thus, we can conclude that performance on the paper-folding task did require the use of processes similar to those in our representational competence measures. However, it is worth noting that the magnitude of these correlations was considerably higher for the CH children than for the NCH children.

The next question is: What is the relationship between the child's competence on the paper-folding task and the parent's teaching strategies? These results are presented in Table 23. Inspection of the table reveals that parental approvals of children's performance were positively related to children's competence, particularly for the CH group. The use of approvals by mothers and fathers of CH children correlated significantly and positively with the children's performance; approvals for NCH children, while positive, were of considerably lower magnitude.

In reviewing correlations between parental strategies and the children's competence on the paper-folding task, it is of interest to note that the relationships varied with the sex of the parent (see Table 23). For mothers and fathers of CH children and for mothers of NCH children, the use of imperatives was negatively and significantly correlated with children's competence. Variations among parent groups were found for other strategies (nonverbal intrusions, attention-getting, structuring and statements).

The results which indicate that children's competence on the parental-teaching task was related to the sex of the parent raises an interesting question. Were the correlations a function of the teaching strategies the parents used or did these findings reflect the children's concerns and anxieties while interacting with their fathers or mothers? In this regard it is worth noting that parental sensitivity to the child's competence did correlate with the child's performance in the case of both NCH parents, but most particularly with the fathers.

In sum, then, children's competence on the paper-folding task was a reflection of children's representational competence. The influence of parental teaching strategies relative to the children's performance was striking primarily in terms of the negative, meaning those strategies that evidenced negative relationships to performance (e.g., imperatives, intrusions, etc.). However, the relationship between parental strategies and children's competence was dependent on the sex of the parent.

TABLE 22

CORRELATIONS BETWEEN CHILDREN'S COMPETENCY
ON PAPER TASK WITH CHILDREN'S COGNITIVE SCORES

	CHILD PERFORMANCE RATINGS FROM PARENT-CHILD INTERACTION			
	CH GROUP(N=60)		NCH GROUP(N=60)	
COGNITIVE MEASURES	MOTHERS	FATHERS	MOTHERS	FATHERS
ANTICIPITORY IMAGERY	.64*	.45*	.16	.01
MEMORY SEQUENCING (PICTURES)	.63*	.58*	.37*	.53*
MEMORY SEQUENCING (GEOMETRIC)	.62*	.57*	.19	.48*
SERIATION	.50*	.46*	.28*	.34*
MEMORY FOR SENTENCES	.64*	.50*	.42*	.59*
SIMON	.66*	.66*	.27*	.36*
WPPSI: VERBAL IQ	.63*	.62*	.29*	.33*
PERFORMANCE IQ	.67*	.64*	.32*	.45*
FULL IQ	.67*	.66*	.34*	.43*

* THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .25$, $p < .05$.

TABLE 23

CORRELATIONS BETWEEN CHILDREN'S COMPETENCY
ON PAPER TASK WITH PARENTAL TEACHING STRATEGIES

	CHILD PERFORMANCE RATINGS FROM PARENT-CHILD INTERACTION			
	CH GROUP(N=60)		NCH GROUP(N=60)	
PARENT STRATEGIES	MOTHERS	FATHERS	MOTHERS	FATHERS
MOD: HI	.21	.15	-.29*	-.09
MED	.09	.27*	-.14	.03
LO	-.32*	-.28*	-.30*	-.03
STATEMENT	-.00	-.03	-.44*	.12
IMPERATIVE	-.34*	-.33*	-.29*	-.01
QUESTION	-.02	.11	-.24	-.35*
VERBAL TASK STRUCTURING	-.10	-.14	-.36*	-.04
NONVERBAL STRUCTURING	-.27*	-.06	-.19	.17
ATTENTION GETTING	-.51*	-.52*	-.50*	-.19
NONVERBAL INTRUSIONS	-.48*	-.22	-.61*	-.41*
APPROVALS	.40*	.54*	.25*	.26*
WARMTH	.07	-.04	.06	.38*
SENSITIVITY	.25*	.15	.32*	.45*

* THESE ARE PEARSON PRODUCT MOMENT CORRELATIONS; $r = .25$, $p < .05$.

6a. The relationship of children's verbal IQ level to parental teaching strategies and to parental beliefs: To determine whether the children's intellectual level was a factor influencing parents' distancing strategies and beliefs, a series of MANCOVA procedures were performed. The verbal IQ scores of the CH and NCH groups of children were divided at the median (Mdn IQ CH = 100.5; Mdn IQ NCH = 117.0) resulting in four groups: Low IQ CH group ($\bar{X}$ = 77.73), High IQ CH group ($\bar{X}$ = 113.47), Low IQ NCH group ($\bar{X}$ = 105.67), and High IQ NCH group ($\bar{X}$ = 127.17). The reason we elected to examine the differential effect of verbal IQ was that children who performed relatively well on verbal measures should be more capable of expressing their ideas, should have a vehicle for enhancing social interactions, and possibly should be more capable of using their verbal skills in solving representational problems. (Means and standard deviations from verbal IQ analyses can be found in Appendix B.)

The results of the MANCOVA are presented in Table 24. A significant number of main effects were found for CH and NCH groups on a number of distancing variables. However, as can be seen from the table, these varied with the population of the parents. Parents of CH children used fewer high MOD's with the Low IQ group, but used more low MODs with this group. Attention-getting behaviors of these parents were more frequently used with the Low IQ group, approvals were used more with the High IQ group, and nonverbal structuring was used more with the Low IQ group. As might be expected, the time on task and the number of interactions was greater with the Low IQ group.

There were also significant interaction effects for verbal IQ group x task within the CH sample. The parents of the Low IQ group used more low MODs on each of the tasks, but the parents of the High IQ group used the lowest number of low level distancing strategies on paper-folding ($\bar{X}$ = 37.03). On the other hand, the use of approvals showed an interesting reversal: It was the High IQ children who received the most approvals on paper-folding ($\bar{X}$ = 36.40) in contrast to the Low IQ children while the use of approvals was similar for both IQ groups on the story task.

For the NCH sample results were similar (see Table 24). The parents of the NCH children used more low MODs with their Low IQ children. These parents also used more statements, more attention-getting behaviors, and more nonverbal structuring with the Low IQ children. One difference between the parents of CH and NCH children was that the parents of the NCH group used more approvals with the Low IQ children. The NCH group parents of the Low IQ children took longer to complete the task and used more interactions, as did the CH group parents of the Low IQ children. The only significant interaction effect (verbal IQ group x task) for the NCH group was in the use of low MODs. The use of low MODs on the paper task was similar for the two IQ groups, but on the story task, more low MODs were used with the Low IQ children ($\bar{X}$ = 52.40).

In looking at each task separately for the Low IQ children we found that on the paper task the parents of the CH group used more imperatives while

TABLE 24

Significant Main and Interaction IQ Group Effects
Obtained from 2 x 2 x 2 MANCOVAs on Parent Behaviors[a]
(High Verbal IQ Group vs. Low Verbal IQ Group x Parent Sex x Task)

Dependent Variables	Main Effect F(1,234)	Main Effect Variable Means[b] Low IQ Grp.	High IQ Grp.	Interaction Effects F(1,231)	Interaction Effect Variable Means[b] Variable	Low IQ Grp.	High IQ Grp.
CH SAMPLE							
MOD: MI	8.56***	64.76	76.76				
LO	18.47***	116.96	91.07	Verbal IQ Grp. x Task 6.18***	Paper	42.53	37.03
					Story	74.43	54.04
Approval	12.39***	45.76	57.10	Verbal IQ Grp. x Task 7.99***	Paper	25.26	36.40
					Story	19.50	20.70
Attention getting	36.98***	138.26	99.20				
Nonverbal structuring	6.20***	76.87	62.20				
Active child engagement	3.52*	197.74	210.20				
Interaction length:							
Time to complete task	8.15***	1,499.12	1,184.01				
Number of interactions	5.56**	339.96	316.36				
NCH SAMPLE							
MOD: LO	10.18***	98.26	75.80	Verbal IQ Grp. x Task 6.01***	Paper	35.86	34.70
					Story	52.40	41.10
Statements	7.22***	93.04	83.77				
Approval	11.16***	59.23	50.56				
Attention getting	8.43***	106.10	91.37				
Nonverbal structuring	6.93***	67.80	52.06				
Passive child engagement	10.12***	80.37	67.83				
Interaction length:							
Time to complete task	7.93***	1,198.70	1,040.96				
Number of interactions	4.67**	317.83	296.36				

[a]Other variables not listed here yielded no significant verbal IQ group effects.
Covariates: mothers' education, fathers' education.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$ **$p \leq .05$ ***$p \leq .01$

parents of the NCH group used more approvals (see Table 25). In analyzing the reading behavior of parents on the story task, both the CH group parents and the NCH group parents read longer with the High IQ children.

In sum, it is clear that the IQ level of the child did play a role in influencing what distancing strategies parents used. However, it should be kept in mind that the intellectual level of the child interacted with the type of task to influence the parent's behavior.

We found virtually no differences in parental beliefs between parents of High and Low IQ children (see Table 26). The only exception was the belief in the process of accumulation of knowledge with parents of Low IQ CH children holding to this belief more than parents of High IQ CH children. On the other hand, the NCH group parents differed on the role of negative feedback as an explanatory developmental principle with the parents of the Low IQ children expressing this belief more often than parents of the High IQ children.

6b. The relationship of birth order to parental beliefs, communication strategies and to parental teaching strategies: In addition to consideration of the intelligence factor influencing parental use of distancing strategies, the birth order of the target child was investigated. The literature is replete with claims that birth order is an important status variable that accounts for personality and intellectual differences among children in the same family. One reason that differences among siblings occur is that parents treat their children differently. The first-born is the parents' first experience as a parent and consequently is subjected to the inexperience of parenting, while the child is in effect an only child and therefore has the unique opportunity for enlisting the parents' attention without competition from other siblings. For this reason, as well as the many reasons so often cited in the literature (Toman, 1969; Zajonc & Markus, 1975), we elected to see if parents treated their first-born children differently than they treated later-born children and whether parents' preferred way of teaching differed as a function of birth order. Essentially, we asked these questions: (1) Do parents differ in their beliefs, communication strategy preferences, and distancing strategies with their first-born compared to later-born children?; (2) Do parents of first-born children who are CH differ from parents whose children are NCH in their beliefs, communication strategy preferences, and distancing behaviors? (Means and standard deviations from the birthorder analyses can be found in Appendix B.)

No significant birth order effects were found among parental beliefs.

The only significant difference found for communication strategies (see Table 27) was that parents, independent of the handicap of the child, preferred distancing strategies as a way of interacting with later-born children rather than with first-born children. On the other hand, a strong trend was found for parents of first-borns to prefer rational authoritative strategies and management goals compared to parents of later-borns.

A more complex set of findings, however, was found when we examined parental teaching strategies (see Table 28). MANCOVA's yielded results

TABLE 25

Significant Main IQ Group Effects within each Task
Obtained from 2 x 2 MANCOVAs on Parent Behaviors[a]
(High Verbal IQ Group vs. Low Verbal IQ Group x Parent sex)

Dependent Variables	Main Effect F(1,115)	Main Effect Variable Means[b] Low IQ Group	High IQ Group
PAPER TASK - CH SAMPLE			
Form: Imperatives	8.52***	72.70	55.96
STORY TASK - CH SAMPLE			
Reading by parent	10.71***	122.23	156.30
PAPER TASK - NCH SAMPLE			
Form: Statements	2.91*	53.17	48.87
Support: Approval	5.32**	36.53	33.66
STORY TASK - NCH SAMPLE			
Reading by parent	11.70***	153.97	187.00

[a]Other variables not listed here yielded no significant verbal IQ group effects. Covariates: mothers' education, fathers' education.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$ **$p \leq .05$ ***$p \leq .01$

TABLE 26

Significant Main IQ Group Effects
Obtained from 2 x 2 MANCOVAs on Construction Variables[a]
(High Verbal IQ Group vs. Low Verbal IQ Group x Parent Sex)

Dependent Variables	Main Effect F(1,115)	Main Effect Variable Means[b] Low IQ Group	High IQ Group
CH SAMPLE			
Accumulation	4.18**	11.70	9.06
Confidence Rating	4.77**	5.67	5.00
NCH SAMPLE			
Accumulation	2.88*	9.07	11.00
Negative Feedback	4.85**	8.44	6.50

[a]Other variables not listed here yielded no significant IQ Group effect. Covariates: mothers' education, fathers' education.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$ **$p \leq .05$

TABLE 27

Significant Main Birthorder Effects
Obtained from 2 x 2 x 2 MANCOVAs on Communication Strategy Variables[a]
(Firstborn vs. Laterborn x CH Group vs. NCH Group x Parent Sex)

Dependent Variables	Main Effect F(1,234)	Main Effect Variable Means[b] Firstborn	Laterborn
Distancing strategies	4.04**	22.73	27.99
Rational Authoritative strategies	2.69*	36.92	32.53
Management goals	3.01*	51.38	49.02

[a]Other variables not listed here yielded no significant birthorder effects. Covariates: mothers' education, fathers' education.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$ **$p \leq .05$

TABLE 28

Significant Main and Interaction Birthorder Effects Obtained from 2 x 2 x 2 x 2 (Birthorder x Group x Parent Sex x Task) MANCOVAs on Parent Behaviors[a]

Dependent Variables	Main Effect F(1,473)	Main Effect Variable Means[b] Firstborn	Main Effect Variable Means[b] Laterborn	Interaction Effects F(1,467)	Interaction Effect Variable	Interaction Effect Variable Means[b] Firstborn	Interaction Effect Variable Means[b] Laterborn
Question	3.05*	197.56	213.24	Birthorder x Parent sex 4.46**	Mother	103.26	103.28
					Father	94.30	109.96
				Birthorder x Task 4.63**	Paper	87.84	103.63
					Story	109.72	109.61
MOD: HI	4.54**	136.46	152.67				
MED	7.38***	41.60	48.06	Birthorder x Task 8.11***	Paper	28.47	34.41
					Story	13.13	13.65
LO	6.94***	200.71	177.42	Birthorder x Group 5.41**	CH	116.91	96.56
					NCH	83.80	80.86
				Birthorder x Task 8.11***	Paper	75.52	74.85
					Story	125.19	102.57
Attention getting	12.41***	237.20	205.51				
Nonverbal structuring	3.24*	139.03	123.81				
Interaction length:							
Total time in seconds	3.27*	2,906.37	2,[illegible]6.17	Birthorder x Task 5.54**	Paper	1,427.06	1,307.21
					Story	1,479.31	1,437.96
Time to complete task	3.87**	2,544.43	2,334.07	Birthorder x Group 3.73**	CH	1,421.09	1,216.57
					NCH	1,123.34	1,117.50

[a]Other variables not listed here yielded no significant birthorder effects.
Covariates: mothers' education, fathers' education.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

* $p \leq .10$ ** $p \leq .05$ *** $p \leq .01$

which indicated that parents of later-borns used more questions, high MODs, and medium MODs. However, parents of first-borns used more low MODs, more attention-getting behaviors, and more nonverbal structuring. Parents of first-borns spent more time with their children and took longer to complete the task.

It will be recalled that some teaching strategies appeared only on the paper-folding task, therefore this task was analyzed separately (see Table 29). There was a strong trend for parents of first-borns to use more task structuring than parents of later-borns. This trend also held for the use of more approvals and more attention-getting with first-borns. Parents used more imperatives with their first-borns than with later-born children, but parents of later-born children used more questions.

Inspection of Table 28 for interaction effects will help understand the basis for our finding significant main effects. It can be seen that the significant interaction effects were due to birth order x task most often. Group difference (birth order x group) interaction effects resulted only for low MODs and time to complete the task with first-born CH children receiving more low MODs and taking longer to complete the task. The task itself was the more critical factor (first-borns received fewer questions on the paper task, later-borns received more medium MODs on the paper task, first-borns received more low MODs on the story task, and later-borns took less total time on the paper task). In essence, irrespective of the handicapping conditions, parents' use of distancing strategies was more often influenced by the task than by any other factor studied here. The results of the birth order analysis are surprising and perplexing. Had more birth order x group interactions occurred, we would not have been surprised because in our previous analyses, parents of CH children did use different strategies. Why the first-born should be treated differently from later-born irrespective of handicap is unclear. It might be thought that the differences in parental teaching strategies would be related to verbal ability since it will be recalled we did find that parents interacted differently with children with a high verbal IQ relative to a low verbal IQ. Thus, it was necessary to determine if the first-born children had higher verbal IQ scores than the later-born children. This difference would be expected on the basis of Zajonc and Markus' (1975) report of the higher IQ of first-borns. In view of our results and this report, we tested for verbal performance and full IQ differences between first- and later-borns. We found no significant differences between first- and later-borns within either CH or NCH groups. Therefore, differences we found between birth order groups and parental teaching strategies were not directly related to IQ, but to birth order alone.

Another interpretation of these results may be attributed to the parents' desire for their first-borns to perform better. Directive teaching strategies may well be perceived as having a more direct link to achievement. The literature tends to suggest that first-borns are more achievement oriented (Marjoribanks, 1979). Could it not be that parental use of directive strategies is consistent with a high parental need for their children to perform well?

TABLE 29

Significant Main and Interaction Birthorder Effects Obtained from 2 x 2 x 2 (Birthorder x Group x Parent Sex) MANCOVAs on Parent Behaviors on the Paper Task[a]

Dependent Variables	Main Effect F(1,234)	Main Effect Variable Means[b] Firstborn	Laterborn	Interaction Effects F(1,231)	Interaction Variable	Effect Variable Means[b] Firstborn	Laterborn
Imperative	5.47**	128.38	109.66				
Question	7.69***	87.84	103.63	Birthorder x Parent sex 4.70**	Mother	47.98	50.22
					Father	39.86	53.41
Verbal task structuring	3.36*	139.76	125.51				
Approval	3.10*	68.18	65.26				
Attention getting	3.16*	152.87	133.17	Birthorder x Parent sex 6.61***	Mother	75.56	63.95
					Father	77.31	69.22

[a]Other variables not listed here yielded no significant birthorder effects.
Covariates: mothers' education, fathers' education.

[b]Appropriate individual means summed from CH mother, CH father, NCH mother, NCH father.

*$p \leq .10$ **$p \leq .05$ ***$p \leq .01$

While we have emphasized the significance of birth order as influencing parental teaching strategies, we decided to examine the role of the sex of the parent relative to birth order in view of our previous findings that mothers and fathers differed in their teaching behaviors. Sex of the parent was entered in the MANCOVAs. Only two significant interactions were found: (1) fathers of first-born children used fewer questions than mothers of first-borns or mothers and fathers of later-borns (see Tables 28 and 29), and (2) mothers of later-borns used fewer attention-getting behaviors than fathers of later-borns or mothers and fathers of first-borns (see Table 29).

In sum, our results suggest that birth order was a viable status variable and that parents differentially interacted with first-born children compared to later-born children. What is perplexing is that even though the IQ scores were significantly higher for NCH than CH children ($\bar{X}$ of verbal IQ of CH = 95.60; $\bar{X}$ of verbal IQ of NCH = 116.42), and that parents of CH children taught their children differently than parents of NCH children, birth order seems to transcend these factors. Finally, our results suggest that birth order should not be ignored as an important factor in defining outcomes of parent-child interactions.

6c. A causal-model analysis for parent-child mutual influences: The conceptual model of this research project argues for distancing strategies as the mediators intervening between parental beliefs and their consequences for representational competence in children. However, the relationship is not hypothesized as a unidirectional one, but rather, as involving feedback from the child, i.e., parental teaching strategies are hypothetically modified by the child's level of performance on representational tasks. We argue that the parent's beliefs are also not independent of the child's cognitive level, but rather, are influenced by the child's observed competence by the parent. Each of these variables (beliefs, teaching strategies, representational competence) is defined by a set of theoretically and empirically defined characteristics.

While a relatively large number of teaching categories were examined, these were categorized into three types of teaching interactions: distancing strategies, non-distancing strategies, and non-task related supports. We focused the causal analysis on the non-distancing teaching strategies because the relationships between distancing stratgies and beliefs, as well as with children's representational competence were not consistent for mothers and fathers within the CH and NCH samples. In preparation for causal analysis, three non-distancing teaching strategies were identified which characterized parent behaviors as follows: cohesions (COHESCM) and imperatives (IMPER) on the paper task and Low MODs (MOD LO) on the story task. It should be noted that each of these strategies share the common feature of high control and not encouraging the child to be an active participant. Of particular interest is the role of cohesion, which is primarily an attention directing strategy aimed at getting and keeping the child's attention on the task. The parental teaching behavior, then, in this model can be identified as at the lowest end of a distancing continuum with emphasis on authoritative control, which we are calling didactic-control strategies in this analysis.

Three tasks define the representational competence variable: anticipatory imagery (TKI12RR), memory for unfamiliar figures (TMASHVGA) and seriation (TSERTOT). These tasks encompass the major characteristics we define as representational competence. They are also principally non-verbal tasks chosen to decrease the effect of verbal ability for the CH sample.

The beliefs used in the path analysis represent those in which the child is seen as a recipient of parental or environmental experience: direct instruction (D), manipulation of the environment (M), negative feedback (N), and positive feedback (P). These beliefs were combined for the model because logically they belong with didactic-control teaching strategies in that parents holding these beliefs would be expected to use didactic-control teaching strategies. Therefore we will refer to these beliefs as didactic-control beliefs. Beliefs which would predict to high level distancing teaching strategies were excluded from the causal model because they were not logically appropriate.

The status variables, age of parent and education of parent that were hypothesized as significant determinants of parents' beliefs were included in the path analysis even though these variables were restricted in their ranges. In this sample most of the mothers were the same age while the same was true for the fathers. The distribution for years of mothers' education was somewhat bimodal, with clusterings at the high school level and college degree level.

Path models were constructed for the families of CH children and for families of NCH children. Since we were interested in the relative contribution of fathers' and mothers' teaching strategies to their children's cognitive development and since we were interested in the role of parental beliefs influencing teaching strategies, we generated a causal model which included three variables: parental beliefs, parental didactic-controlling teaching strategies and children's representational competence. The family behavior variable used in the path model was a combination of each parent's didactic control teaching strategies.

Two hypotheses were formulated: Hypothesis I predicted relationships between parental beliefs and teaching strategies; Hypothesis II predicted relationships between parental teaching strategies and children's representational competence.

In formal terms, Hypothesis I states that parents holding the belief that children learn through exposure to direct instruction, negative and positive feedback, and environmental manipulation would express these beliefs through didactic-control strategies. Hypothesis II holds that didactic-control strategies would influence children's representational competence negatively, and that poorly performing children would be more likely to elicit didactic-control strategies from their parents than more competent children.

Using a Lisrel analysis, a model was hypothesized and tested separately for CH and NCH families. Figures 2 and 3 depict the assumed causal scheme and show the estimated standardized path coefficients. The Lisrel estimation procedure (Jöreskog & Sörbom, 1981) was used because it allowed one to estimate the path coefficients between a family behavior factor and a child's representational ability factor. The use of factors rather than observed variables minimizes the attenuating effects of measurement error and also tends to reduce the instability in the path (regression) coefficients that stem from excessive multi-colinearity.

The reader will note that Hypothesis II suggests a non-recursive or interaction model underlying the relationship between parental teaching strategies and their child's representational competence. This interactive relationship is shown pictorially by the two opposing arrows between teaching strategies and representational competence. A primary substantive concern here is whether one "causal" direction is more important than the other.

Before proceeding with a discussion of the major "causal" results, those determining the relationship of parental beliefs to family behaviors and of family behaviors to children's representational ability, we will begin with the influence of the status variables, parental age and education, on parental beliefs. The path coefficients for mothers' age were not significant, although in the CH sample (see Figure 2) there is an indication (.12) that the older the mothers, the more likely they believed in direct instruction, manipulation of the environment, negative feedback and positive feedback (DMNP), called didactic-control beliefs. The same relationship (.16) was shown for the fathers of the NCH group (see Figure 3). These findings are consistent with predictions.

The education variable yielded somewhat inconsistent results. In the CH sample (see Figure 2), although the value of the path coefficient (-.21) was not significant, there was an indication that the more educated the mother, the less likely she was to hold the didactic-control beliefs (DMNP). This relationship is consistent with our predictions. For the CH group, fathers' education did not influence their beliefs (.03). In the NCH sample (see Figure 3), the higher the mothers' education, the more likely she was to hold the didactic-control beliefs (.28, $p < .05$). Fathers' education, although not significant, showed the same positive trend (.13). These results are contrary to our predictions. Since only one of the status variables had a small but statistically significant relationship with didactic-control beliefs, one must go beyond parental age and education to explain the obtained relationship. We have no data which enable us to do so.

Inspection of the standardized path coefficients in Figure 2 reveals that mothers' beliefs in the role of direct instruction, etc., did predict significantly to their teaching behaviors, but this was not the case for the fathers. Thus, Hypothesis I was partially supported.

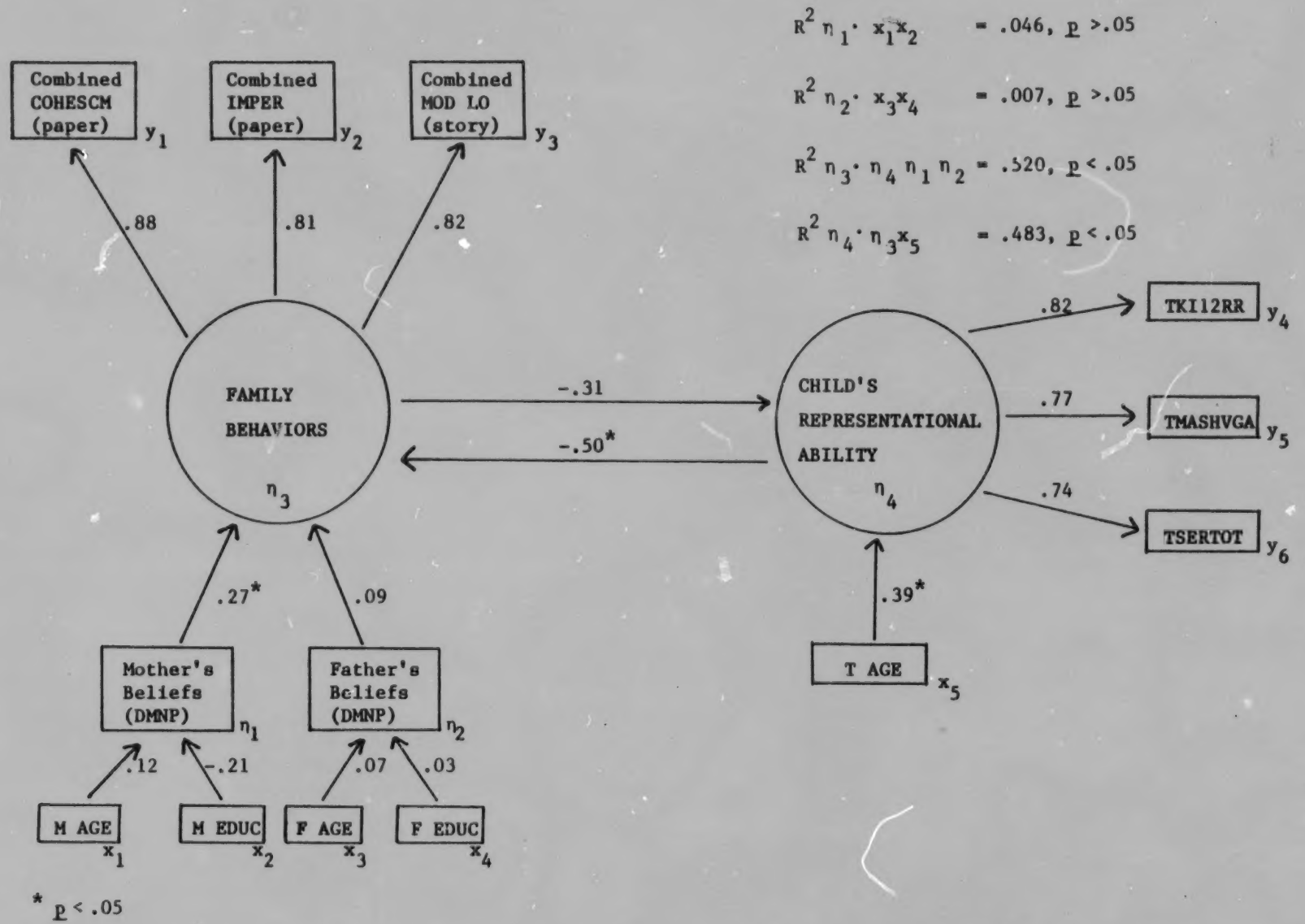
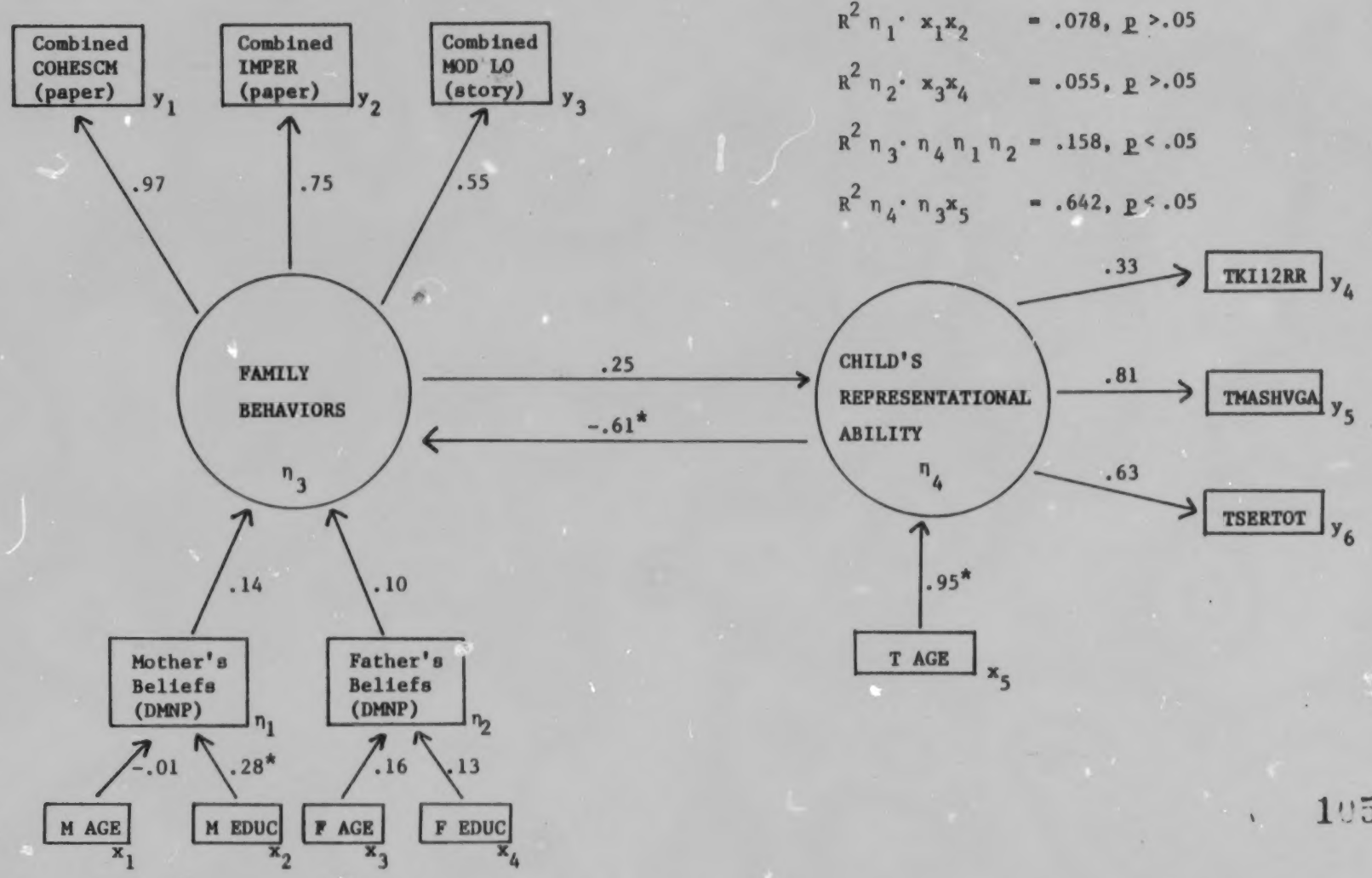


Figure 2. Path Analyses of Parent-Child Mutual Influences within Families of CH Children (N=60).



* $p < .05$

Figure 3. Path Analysis of Parent-Child Mutual Influences within Families of NCH Children (N=60).

As for Hypothesis II, our analysis (see Figure 2), showed that the significant finding was that children's representational competence level had a significant influence on the parents' use of didactic-control teaching strategies. The CH children's performance, while moderately influenced by their chronological age, had greater effect on the parents than the parents' behaviors had on the children. The magnitude of the path coefficient of CH children's representational competence to family beahvior was significant (-.50, $p < .05$), while the path coefficient for the family behaviors effect on the children's representational competence was a nonsignificant -.31. The signs of the relationship in this model were both negative, suggesting that the model was not in equilibrium. In summary, these results lead us to conclude that the CH children's representational competence influenced the parents' use of didactic-control teaching strategies to a greater degree than the parents influenced the children's performance.

The model for NCH families (see Figure 3) shares some characteristics with the model for the CH group, except that in the NCH model the beliefs of fathers and of mothers were not significantly related to family teaching behaviors. Examination of the directional relationship between parental teaching strategies and children's competence reveals that NCH parents were also responding to the ability level of the child, that is, the more competent the child, the less likely the parent was to use didactic-control teaching strategies (-.61, $p < .05$). Similarly, the less competent the child, the more likely the parent was to use didactic-control strategies. Didactic-control strategies by the NCH group parents did not play a significant role relative to the children's representational competence. As expected, age contributed significantly to the NCH children's performance on the representational tasks.

In both groups it is clear that children's representational competence did have an impact on how parents teach their children. Path analysis, therefore, partially confirmed our basic premise that parents and children influence each other's responses. The fact that parents of both CH and NCH children reacted to the level of the children's representational ability suggests that the children's competence level was an important factor influencing the type of teaching strategies parents used. The fact that measured parental beliefs had little to do with didactic-control teaching strategies (compared to the child's ability) suggests that much of the parental teaching behavior may be a learned response based on what works and what doesn't work in actual interactions with their child rather than what theory might suggest is optimal parental behavior.

Summary, Conclusions and Implications

Summary of Major Findings

The results of this study can be summarized as follows:

(1) Parents of CH children hold the belief that children are passive recipients of knowledge and learn through negative feedback (unpleasant consequences) to a significantly greater extent than parents of NCH children. No differences were found for any of the other beliefs.

(2) Parents of NCH children were more child-oriented than parents of CH children, with mothers of NCH children being more child-oriented than any of the other parent groups in the study.

(3) Generally, all the parents viewed their own children as similar to children in general.

(4) Generally, parental teaching strategies were correlated across tasks with the exception of intrusions, imperatives, verbal task structuring and reading strategies which seem to be task specific.

(4a) Although consistency across tasks was noted, the frequency of use and the magnitude of correlations varied among the four parent groups.

(4b) Parental teaching strategies varied with task, with paper-folding providing a wider array of parent behaviors than story-telling.

(4c) Parents of CH children used more low level demands, non-verbal task structuring, attention-getting, imperatives, took longer to accomplish the task, interacted longer in general, and were less sensitive to the child than parents of NCH children.

(5) CH children tended to show more variability on some cognitive tasks than NCH children; CH children generally scored lower than NCH children on all cognitive tasks.

(6) Relationships between parental beliefs and parental use of distancing strategies were generally minimal and not consistent; although some findings were consistent with our predictions, these were contingent on sex of parent and child's pathogenic state.

(7) The predictions of distancing theory have been supported in part (especially for CH children) as evidenced in the following findings: High level mental operational demands predicted to high child performance on some child assessments; low level mental operational demands predicted to low child performance on some of the child assessments; use of statements

or imperatives predicted to low child performance on some of the tasks; structuring behaviors predicted to low child performance on some tasks, as did parental efforts getting the child to attend to the task at hand.

(8) A reciprocal relationship was found between parent and child behavior, where the less intellectually able the child the more likely the parents would use low level cognitive demands and where the child was intellectually able, the more likely the parents would use high level cognitive teaching strategies. Thus the IQ level of the child influenced what distancing strategies parents used.

(9) Few significant birth order effects were found relative to parental beliefs and communication strategies. Strong trends were found for parents of first-borns to prefer rational authoritative strategies and management goals compared to parents of later-borns who preferred distancing strategies. Birth order effects, however, were found relative to parental teaching strategies with parents of first-borns using more didactic-control strategies compared to parents of later-borns.

Birth order, it can be concluded, is a relevant factor influencing parental teaching strategies.

Conclusions

Two types of conclusions can be drawn from this research project: conceptual and methodological.

On the conceptual level, our basic argument that a reciprocal set of relationships exists between parental beliefs and parental teaching strategies and between these teaching strategies and representational competence of preschool children was partially supported, primarily for the relationships predicted between parental teaching strategies and children's representational competence.

The obtained relationships between parental beliefs and teaching strategies were for all practical purposes not significant. Yet, it seemed reasonable at the outset to expect concordance between how a parent construed development of the children's representational competence and how the parent acted to facilitate that development. This expectancy was based on the results reported by McGillicuddy-DeLisi (1982) in a previous study employing the same model used in this study, but with working- and middle-class families of nonhandicapped children. McGillicuddy-DeLisi reported, "beliefs were predictive of child-rearing practices above and beyond factors of SES and family constellation. Thus, there is some support for our hypothesis that there are factors internal to the parent, such as beliefs, from which parents' child-rearing styles may emerge" (McGillicuddy-DeLisi, 1982, p. 294). However, the relationships between beliefs and behaviors McGillicuddy-DeLisi (1982) reported were dependent on

the teaching task involved. Beliefs, then, are not generalized characteristics, but limited to specific contexts. In this study, even this level of generalization was not found. Why is this the case? All we can offer at this point are speculations.

Beliefs were conceptualized in this study as primarily reality definitions, that is, world views parents hold regarding child development. World views form a core orientation that does not necessarily incorporate behaviors which would express these beliefs. Perhaps another level of beliefs exists which refer to the way a core belief can be expressed. For example, two parents may agree in principle that children's representational competence develops through varied exploratory experiences. However, one parent may believe that the way to stimulate exploratory experiences would be by engaging actively with the child while the other may believe that creating a permissive, safe environment with minimal adult interaction would be the most appropriate. Since we did not directly examine the parents' beliefs regarding instrumental behaviors relative to world view beliefs, we may have inadvertently committed the error so typical of attitude research, where attitudes have been poor predictors of behavior.

On the other hand, since the results of the earlier McGillicuddy-DeLisi (1982) report are not consistent with the results of this study, the discrepancy must be addressed. The problem may not only be conceptual but also methodological. Consequently, we leave that discussion to a later section and turn now to the second part of our model, the relationship between parental teaching strategies and children's representational competence.

It will be recalled that we discovered that the intellectual level of the CH children plus the birth order of the children influenced parents' behavior. These findings suggest that the child's characteristics may well play a significant role impacting parental teaching strategies. We were not able to determine the relative importance of which child characteristics influenced parental teaching strategies. Nevertheless, our findings confirmed the significance of children's characteristics as relevant determinants of parent behaviors. These results are in line with the general argument that understanding of children's influence on parents is necessary if one wants to understand the dynamics of parent-child interactions (Bell & Harper, 1977).

To add to the complexity of the problem of identifying determinants or perhaps constraints on parent behaviors, we found that the context, i.e., the task that engaged the parent and children, had an important role to play in defining the range and type of parental teaching strategies used, e.g., the paper-folding task provided opportunities for teaching not found with the story-telling task and vice-versa. Leaving beliefs aside, then, we are certain that children's characteristics (IQ and birth order) in conjunction with the task to be taught interact, and this complex interaction influences the quality and quantity of parental teaching strategies. Thus, we have not only identified some of the relevant ingredients which interact to influence parental behavior, but we have also been able to identify some significant

relationships between the parents' teaching strategies and children's representational competence.

Beginning with the negative, we have shown that parents' use of didactic-controlling strategies related negatively to the children's performance on virtually all of our tasks. To understand this set of results requires consideration of the psychological characteristics of these types of teaching strategies. Basically, the didactic teaching techniques are authoritative, intrinsically definitive in scope and allow for no obvious disagreement. Disagreements in this context require noncompliance to the parents' message. When a parent tells the child in no uncertain terms to act in a particular way, the child is not encouraged to doubt, to examine, or to reflect on alternatives. Rather, the child is told and expected to do what he or she is being told. If such parental behaviors are indicative of a consistent and pervasive pattern of response, then we can ask where are the opportunities for the child to think for him/herself, to explore alternatives or to reflect on alternative methods as to how to proceed? The representational competence measures in this study often require the child to be an active problem solver. The child who has been exposed to didactic-controlling strategies has probably not had the opportunity to develop strategies or confidence as to how to proceed in situations which involve self-determination. The child may be limited not only in terms of an available repertoire of problem-solving strategies, but also may not have acquired the confidence in his own competence. Even though the parents did not appear to be harsh or punitive when the child did not perform well, it may be the case that the child did not feel free or comfortable to take risks for fear of failing. While these are speculations, there is reason to think that the interpretation has merit. The literature is replete with studies which point out the negative consequences of authoritative behavior of significant adults for children's cognitive and affective development (See Sigel, Dreyer, & McGillicuddy-Delisi, in press, for literature review).

Before we leave this issue, it should be pointed out that while our results are consistent with many reports in the literature, we are still left with the need to explain these results in a way that deals with the question: What is there about didactic-controlling teaching strategies that produces negative cognitive outcomes, even when parents are benign?

Turning now to a discussion of the relationships between parental distancing strategies and cognitive outcomes, our results were equivocal. For the CH children, parental use of distancing strategies yielded positive correlations, but this was not the case for the NCH children. Ironically, we did find that the parents of CH children not only used high level distancing strategies, but did so effectively. These results are different from those obtained with parents of NCH children. There are two possible explanations for these findings. One is that CH children probably are exposed to didactic-control techniques in their therapeutic programs, while the parents, who use high level distancing strategies, provide alternatives

which are in sharp contrast to the children's school experience. The novelty, then, of the parents' approach may convey the parents' confidence in the child's intellectual and communicative skills.

A second possibility is that these children, when exposed to higher level strategies, have opportunities to employ their communication skills which stand them in good stead in performing on our cognitive tasks. In effect, high level cognitive demands may well provide a set of experiences which allow children to "practice" their problem-solving skills. For the NCH children, exposure to high level distancing strategies is not only less novel, but may lose its impact because the children are already using the competencies these strategies are presumed to enhance.

Although the relationships between parental teaching strategies and children's competence is far from understood, the results of this study show that it does make some difference how parents teach their children. One of the major findings is that the obtained relationships are dependent on the task involved. The differential relationships found between the paper-folding and the story-telling tasks temper the generality of our findings. Does this mean the generalizations regarding the influence of parental teaching strategies are not possible? The answer is no. Since some of the results relating didactic-controlling strategies to cognitive outcomes are consistent across task (the magnitude of the correlations ranges from low to moderate), it is clear that these strategies can be said to have a generally negative influence on children's representational competence. To be sure, research is needed to help explain the unaccounted for variance.

More research is needed directed at a more intensive study of the dynamics of the interactions between parent and child, the role of the "teaching history" of parents and children, and the role of the child's comprehension of the parents' language. Finally, there is need to do structural analyses of a variety of tasks or contexts in which parents and children interact which could lead to defining appropriate and productive teaching strategies relative to classes of tasks.

There is reason also to think that some of our findings may have been due to methodological problems. One particular issue relates to how we identified and scored teaching strategies in the one-time context. Not only was the time frame limited, but using frequency counts for each strategy limited our understanding of the stream of interactions that transpired between parent and child. There is, then, a question of whether each teaching strategy abstracted from particular contexts and counted as a set of acts to be summed is the best procedure. Of course, in spite of that criticism we did get a number of significant results and even many findings which conformed to our expectations. In that sense the procedure was justified. Nevertheless, had alternative analytic procedures been used, such as sequence or linguistic analyses, we might have obtained more powerful and consistent outcomes. Sequential analyses may be a productive direction to take to capture the quality and meaning of the interactions. Only future analyses will answer that question.

Related to the issue of scoring and coding observations, is the choice of the teaching task. We found that the task itself created constraints regarding the kinds of strategies parents used. Note the differences in strategies used on the paper-folding task compared to the story-telling task. Further research needs to be done, increasing the types of tasks used and extending the length of time the parent and child spend together using the same class of observational categories. Further, it may be desirable to use more than one time point in sampling parent-child interactions. By so doing, opportunities to check on the consistency of parental behaviors across more than one time period can occur. By demonstrating these effects, we could begin to define a class of social factors that do play an important role in the child's intellectual functioning. Hopefully, results of this type will stimulate further investigations accentuating the role of direct social inflences--a position advocated not only by us but by investigators interested in determining the course of cognitive development. To understand how children come to know about their world, and the cognitive processes they employ in this continued search is in part defined by their social mileiu interacting with the parents' ways of teaching.

Implications of the Research for Practitioners

We have discussed some of the strengths and shortcomings of our research effort. We shall now address the practical implications of this project.

Our findings regarding the significance of didactic-controlling strategies have direct implications for educational practitioners and parents. Since we found that such strategies correlate negatively with children's cognitive performance, it would seem reasonable to use such strategies cautiously and to try alternative approaches. Higher level distancing strategies, for example, would be appropriate because for NCH children these strategies are benign, but for CH children they have a positive effect.

In addition to the implications these findings regarding teaching strategies have for the practitioner's use, these results should sensitize practitioners to the role of parental teaching strategies. There is reason then to recommend that family histories should contain information on how parents characteristically teach their children. Such information should be included as practitioners develop a coherent intervention program.

Since we discovered that the parents' ways of teaching their children are influenced by such child characteristics as IQ, then in working with parents the practitioner should identify parents' constructions of their children's abilities. Helping parents extend their perspective may result in a better match between practitioners' recommendations and parents' behaviors.

What our research has conclusively demonstrated is that fathers' and mothers' contributions to their children's intellectual functions differ, but each parent does have particular influences. What is important, however, in this context is that the practitioner should realize that fathers and mothers differ in their ways of interacting, and hence contribute differentially to the child's cognitive functioning. Fathers' and mothers' ways of parenting are correlated. Nevertheless, we believe that the statistically significant correlations should not mislead the practitioner to assume fathers and mothers should be considered as similar. While our data do not tell us how parents cope with their differences, the practitioner should be aware of this possibility. This recommendation is based on the fact that statistical significant correlations may not be psychologically significant. The unaccounted for variance may well prove to be of considerable moment.

The implication of this research for those working with CH children is clear. Since distancing strategies do relate positively to CH children's representational competence, practitioners might be well to incorporate these findings into their own practice. We have identified the negative outcomes for didactic controlling strategies--suggesting that there might be a self-fulfilling prophecy operating here, both for practitioners and for parents--the less able the child is judged, the more didactic and the cycle begins.

While we have emphasized the practical implications of the teaching strategies, the findings regarding the role of beliefs parents hold regarding children's cognitive development should not be overlooked. In spite of the lack of findings of a direct relationship between parental beliefs and teaching strategies, there are logical reasons for continuing to consider beliefs as salient determinants of parental behaviors. At least two reasons for holding to this conviction can be identified. The first is that parental behaviors do not emerge de novo, but must have some personal dispositional determinants. We have already presented one interpretation for this lack of significant correlations of beliefs to behaviors; namely, the possible variations in expression of beliefs. The second reason for the results may be due to the methods of determining beliefs. This is not the place to dwell on the methodological issues other than to acknowledge the problem.

It still seems reasonable to contend that when practitioners seek to identify the rationale of parents' behaviors, some effort should be made to identify the parents' rationale for employing the strategies they do. We suspect that child characteristics interacting with parental constructions of children's development in general and their own child in particular, may well converge as determinants of the types of teaching strategies parents use.

Final Word

The complex set of findings and issues presented in this report have significant findings for how research and practice interrelate. While not all of our questions are answered, we believe we have made a beginning in untangling the complex nature of the role the family plays as a critical social influence relative to the development of children's intellectual competence.

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APPENDIX A

ADMINISTRATION AND CODING MANUALS

Communication Strategy Interview

Construction of the Child Interview

Family Influences on Childrearing Interview

Parent-Child Interaction Observation Schedule

Children's Cognitive Assessments

COMMUNICATION STRATEGY ADMINISTRATION AND CODING MANUAL

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Content: The questionnaire consists of 12 hypothetical situations which involve a parent and a four-year-old child interacting within the context of a situational problem or "critical incident." Considerations of typicality and diversity governed the selection of the hypothetical situations in order to insure that parents could relate to them and so that parental responses could be obtained over a wide range of circumstances. One-half of the situations present "Mother" as the parent and one-half present "Father." Within this dichotomy, half of the situations involve a female child and half involve a male child. All toys, settings and activities presented within the situation were selected as representing neutrality with respect to sex-role stereotypes.

Within the set of 12 hypothetical situations, four are concerned with teaching facts and principles to the child, four with the child's social skills and interactions with others, and four with management of the child's overt behavior. Of each situation type, half are positive instances and half are negative. The positive-negative dichotomy will be explained within the definitions of types of situations presented below.

A teaching situation is defined as one in which the parent and child are involved in an information exchange in which the primary focus is on cognitive content. This content involves either the learning of some information or the attainment of a concept. The content of the interaction involves some feature of the physical environment. A negative teaching situation is one in which the child has expressed or evidenced some misconception. A positive situation is one in which the child has no apparent misunderstanding or misconceptions about the subject matter and is simply acquiring new information or knowledge.

A social situation is defined as one in which the parent and the child are engaged in an exchange where emphasis is placed on the child's interpersonal capabilities or environment. The content may involve prescriptions and proscriptions regarding social situations or it may involve some social skill, such as role-taking. A negative situation is one in which the child is evidencing a noticeable lack of some social skill or failing to interact with another in a socially appropriate manner. A positive situation is one which provides an opportunity to encourage a social response, but the child is not evidencing socially inappropriate behavior.

A management situation is defined as one in which the focus is on the child's overt behavior with some object in his physical environment. A negative situation is one in which the child is misbehaving and termination of the misconduct is desired. A positive situation is one in which the child is not actually misbehaving but he is not engaged in a behavior that complies with the immediate demands of the situation. The 12 hypothetical situations, including the four response options, are presented by situation type in the Appendix.

The order of presentation of situations was determined by assigning a number to each situation and then sequencing them through the use of a random number table (Winer, 1971, p. 881). The three situation types and the positive-negative dichotomy were included in the questionnaires in order to ascertain response consistency within and across variability in content and severity of child behaviors. The purpose is to explore the extent to which communication strategy preferences and self-predictions are influenced by situational factors. The same communication strategy may be responded to differently by parents in different situations because of possible foreseen differential consequences in terms of the child's cognitive state, self-

esteem, etc. These possibilities are examined when the rationales for their response selections are elicited from parents in the Communication Strategy Interview.

Response Options: The communication strategy response options included in the questionnaire were selected to represent a range of appropriate behaviors for a parent to engage in with a young child. The four response options can be thought of as varying in the extent to which an explicit demand is made for the child's active problem-solving involvement.

The "distancing" response option is an interactional communication strategy in which the child's active cognitive and verbal participation is invited through a verbalization that functions as an inquiry directed toward the child. The "authoritative" response options (rational and direct) are one-way communication strategies that do not stimulate the child's active verbal participation, but are directed at the situational issue through didactic methods. The authoritative options differ in amount and type of cognitive content conveyed to the child: (1) statements that include a logical explanation (rational), and (2) statements that iterate an observable fact, but without an explicit explanation. Finally, the "diverting" response option is a noninvolvement strategy in the sense that no demand is made on the child to direct himself to the situational issue. Rather, the parental statement permits and encourages the child to disengage from the problem at hand.

These four response options were selected as representations of different levels of distancing potential. While no options presented in questionnaire form can fulfill all the requirements of distancing behaviors described by Sigel (1972), the "distancing" strategy contains the highest potential for

a distancing experience for the child, followed by rational-authoritative, direct-authoritative and diverting strategies. The questionnaire items and response options are presented at the end of this section.

Administration Procedure: Each questionnaire is administered individually to both the mother and to the father. The interviewer first establishes rapport with the parent and explains the purpose of the Communication Strategy Questionnaire and the Communication Strategy Interview. The parent is than asked to read and sign the consent form. The interviewer presents the printed instructions to the parent and informs him or her that questions for clarification may be asked at any point. The parent fills out the questionnaire at his own pace with the interviewer present.

Administration and Coding Procedures

Interview Questions, Alternatives, and Probes: The interviewer is required to avoid certain statements in conducting the interview. While it is permissible to paraphrase questions in order to clarify ambiguous responses, extreme caution should be maintained by the interviewer to avoid leading or embarrassingly repetitious questioning. For this reason, alternate probes and follow-up probes have been constructed. The following three sets of questions and their accompanying probes would be asked according to the following schedule:

Preferred Communication Strategies

1. What do you think is the best way for a parent to handle such a situation?

   Alternate: What is the best response for a parent to make in this situation?

2a. Why do you think that this response is the best response in this situation?

   Alternate: What makes this response the best one for this situation?

If the parent does not provide a comprehensible and substantive (i.e., scorable) reason for the stated preference, the following probe is asked.

2b. What do you think that the parent in this situation would be hoping to accomplish if he or she were to use the response that you believe to be the best way of handling the situation?

   Follow-up probes: (i) What would the parent in this situation be trying to accomplish?

   (ii) What do you think the parent would be trying to achieve in this situation?

   (iii) What would be the parent's primary goal in this situation?

   (iv) What would be the main objective in this situation?

   (v) What do you think that the parent would be aiming at?

If the parent does not give a satisfactory answer, the interviewer should try as many, and only as many, of the follow-up probes under

Question 2b as are necessary to elicit a scorable answer before proceeding to Predicted I Communication Strategies.

Predicted I Communication Strategies

1. If this were a real situation and you were the parent in it, how do you think you would probably respond?

   Alternate: How do you think you would probably respond if this were a real situation involving you as the parent?

Regardless of whether the parent indicates that s/he would handle the situation in the same or in a different manner than was previously stated as a preferred response, rationales should be elicited with the following probes.

2a. Why do you think you would respond in that way?

   Alternate: (i) Why would you (repeat the strategy just started by the parent)?

   (ii) Why do you think you would handle it that way?

If the parent does not provide a substantive rationale for the strategy, proceed to Question 2b.

2b. What would you hope to accomplish by (repeat the parent's strategy)?

   Follow-up probes: (i) What would you be trying to achieve?

   (ii) What would be your primary goal in this situation?

   (iii) What would be your objective?

   (iv) What would you be aiming at?

The interviewer should try only as many of the follow-up probes as are necessary to elicit a scorable answer before proceeding to Predicted II Communication Strategies.

Predicted II Communication Strategies

1. If you were the parent in a real situation just like this one, and you tried...(indicate the response that the parent has just stated he would do), but the child still did not respond as you hoped (he or she) would, what then might you try next?

   Alternate: (i) What might you try if (repeat the problem presented in the hypothetical situation) did not occur?

   (ii) And if that (previous strategy) didn't work, what would you try next?

2. Why would you respond that way at this point in the situation?

   Alternate: Why do you think you'd do that?

If the parent does not respond in a scorable fashion, probes listed under Predicted I Communication Strategies (2b) should be administered as necessary.

Response Units: A response unit is a meaningful unit of analysis designated within the total parental verbal response for each of the 12 Communication Strategy Interview items. The first response unit is the parent's verbal statement in answer to he questions and probes concerning the response that the parent believes to be best for the hypothetical situation and his or her associated reasons for this choice (Preferred strategy). The second response unit is the parent's verbal statement in answer to the questions and probes concerning the response he or she would probably make in a real situation of the same nature, taken together with its accompanying justifications (Predicted I strategy). The third response unit is the parent's verbal statement in answer to the questions and probes concerning the probably contingent response assuming that the parent's initial response has not been successful (Predicted II strategy).

The coder is to listen to the entire response unit before coding; however, the coder may relisten to the response unit either in part or in its entirety as often as is necessary. It is important in scoring that the coder disregard any extraneous material not directly elicited by the interviewer's questioning but rather introduced by the subject as a personal digression. The coder is to further disregard any information elicited by improper interview procedures, e.g., leading questions, questions beyond those prescribed as paraphrasing the formal interview schedule questions and probes, etc.

Administration Procedures: The Communication Strategy Interview is administered upon completion of the questionnaire. The parent is asked to respond to a number of questions that would clarify his reasons for preferring certain types of communication strategies. The parent is first told that the options included in the questionnaire do not necessarily represent every way of responding to a situation. The interviewer instructs the parent that during the interview it is permissible to designate responses that may not have been presented in the questionnaire, if he or she feels there is a substitute that is better or more appropriate. Caution is given to the fact that although the parent has the option to insert a new response, it is not a requirement of the task. The interviewer then proceeds with the structure outlined above.

Coding System for Communication Strategies: All preferred and predicted communication strategy responses are identified in terms of the response category or categories indicated. There are 8 general response categories

which represent different ways of communicating with a young child in different situations:

Distancing: This response category covers responses by the parent which attempt to influence the child through the use of a procedure intended to induce the child's active verbal participation centered on a problem defined in the situation. This type of communication places a mental demand on the child and functions as an inquiry directed at the child from the parent. It may take the form of an interrogative sentence ("How will your friend feel without anything to play with?") or a declarative sentence ("Tell me how you think your friend feels.").

Examples: "What do you think is right?"

"Tell me what might happen to the toy if you play with it very rough?"

"Can we build the tower taller if we make the bottom wider?"

Rational Authoritative: This response category includes communication strategies which provide the child with a statement of fact, rule, or information, and which are accompanied by a supporting elaborative explanation that is an appeal to reason or to social norms.

Examples: "I'd tell the child not to throw blocks because the blocks flying through the air could hit something and break it."

"Metal spoons are too heavy to float."

"I'd tell him not to eat candy now because there are rules about eating habits everyone should follow."

Direct Authoritative: This category is used for a parental response that is directed toward changing the child's behavior by providing a statement of fact or rule without any further elaboration or explanation.

Examples: "The metal spoon will not float in water."

"You must stop throwing the blocks."

Diversion: This category refers to responses that the parent might prefer to try so as to involve the child in some behavior or activity other than the one that is specified in the hypothetical situation. The parent attempts to alter the child's behavior by proposing a substitute activity which is not explicitly relevant to the problem at hand.

Examples: "Why don't you play with one of your favority old toys instead of that new one?"

"Since you're having trouble with the blocks, why don't you play with another toy instead?"

Activity: This category includes all responses that indicate parent-child participation, including demonstrations and/or experiments that the parent performs with or for the child.

Examples: "I would sit on the floor and help her build the building with the blocks."

"I would bring in lots of different objects to show him that things made of different materials either sink or float."

Authoritarian Behavior: This response category refers to parental choices of means of responding to the child in the situation that includes physical manipulation of the child and/or his surroundings, or to the use of verbal threat or abuse.

Examples: "I'd probably spank him then."

"He'd better listen then and he'd know it."

Passivity: This response category includes parental responses which indicate that the parent will not intervene in any systematic way to modify the situation. Concessions to the child's desires are included in this category.

Examples: "It's her choice to play with the children or not--if she chooses not to, I'd just let her be."

"I'd give him a piece of candy. He'll want to eat it no matter what I say to him."

Other: This category is included to allow for the possible introduction of a childrearing goal that is not consistent with any of the previous categories.

Combinations of Strategies

Cases might arise in which the parent refers to more than one response category in a given response unit. If the parent states that one response would precede the other, the first strategy discussed is coded for that response unit. If the parent indicates that two or more categories are considered jointly and not separately, the following rules are applied for coding purposes.

(1) If "distancing" occurs concurrently with "rational authoritative," "direct authoritative," or "activity" strategies, code as "distancing."

(2) If "rational authoritative" and "direct authoritative" strategies occur concurrently, code as "rational authoritative."

(3) If "activity" strategies occur in conjunction with "rational authoritative" or "direct authoritative" strategies, code as "activity."

(4) "Authoritarian behavior" strategies subsume all strategies except "passivity" strategies. That is, if "authoritarian behavior" occurs with "distancing," "rational authoritative," "direct authoritative," "diversion," "activity" or "other," code as "authoritarian behavior."

(5) "Diversion" strategies subsume all strategies except "passivity" and "authoritarian behavior" strategies. That is, if "distancing," "rational authoritative," "direct authoritative," "activity" or "other" occur in conjunction with "diversion," code as "diversion."

(6) "Passivity" strategies subsume all other strategies. That is, if any other strategy occurs concurrently with "passivity," code as "passivity."

(7) "Other" is subsumed by any communication strategy it occurs with. That is, if any codable strategy occurs in conjunction with a strategy that is encompassed only by the "Other" category, refer only to the strategies that are consistent with defined coding categories.

(8) The number of categorically different strategies that the parent proposes in a concurrent manner should be noted on the code sheet.

Coding system for communication strategy rationales: Parental rationales associated with the three communication strategies given for each interview then are coded according to four criteria: Childrearing goals, temporal focus, childrearing orientation, and situational constraints. The scoring procedures for each of these criteria are presented below.

Childrearing Goals

Types of objectives parents express as rationales for the communication strategies they propose are coded according to six categories.

Parents may refer to only one goal or they may refer to a number of goals simultaneously when discussing a particular communication strategy. If a parent refers to more than one goal, each goal is coded. These goals that are given little emphases (i.e., expressed with lesser frequency or less intensity relative to other goals within the response unit) are coded by assigning a score of 1. Goals which are expressed as primary objectives receive a score of 2. Whenever a parent refers to only

one goal, that goal is assigned a score of 2. All goals that are not mentioned by the parent are assigned a score of 0.

The categories of parental childrearing goals reflect different emphases on aspects of the child and/or the child's environment. These six categories are termed cognitive, personal-social, physical, child-management, assessment, and nonchild goals. Each category will be defined below.

(1) Cognitive: A cognitive childrearing goal is defined as a parental concern for the child's intellectual capabilities and/or functioning. Parental goals that imply an intellectual objective for the child are coded within this category. The substance of a cognitive goal may include concept formation, concept application or cognitive processes.

Examples: "He should learn that the boat will float and the spoon should sink."

"I want her to understand that heavy things will sink and light ones float."

"I would want him to think about what could happen at the park if he were alone."

"It's important to always encourage a child to make decisions so she can become a thinking adult."

(2) Personal-Social: Personal-social goals are defined as parental concerns for the child's emotional-dispositional state and/or development, as well as the child's interpersonal abilities. Parental objectives that focus on how the child feels, on some dispositional characteristic of the child or on the nature of the child's relationships and/or interactions with others are personal-social goals.

Examples: "I'd like her to grow to be a happy person."

"As soon as he got upset with the building I would help him so he wouldn't get frustrated."

"I'd take him to the swings and try to get him to talk to the other kids because I want him to play with other kids."

"I want him to be confident."

(3) Physical: The parent expresses concern for the child's biological state and/or physical safety. Concerns for the child's health, physical needs and physical skills are included.

Examples: "I want him to eat his supper because it's better for him than candy."

"She'll become better at fitting the logs together the more she plays with them."

"I don't want him to get hurt by flying blocks."

(4) Child Management: The parent focuses on instilling positively valued behaviors and/or prohibiting negatively valued behaviors in the child. The parent may emphasize socially approved behaviors or prosocial prescriptions for behavior or may focus on controlling antisocial or non-accepted modes of behavior.

Examples: "He has to stop pestering me when I'm busy."

"I want her to be ready on time."

"I don't want him to hurt someone by throwing the blocks all over the room."

"I want him to be careful about other people's property."

(5) Assessment: The parent focuses on gaining a greater understanding of the child's internal state/functioning or overt behavior. The parent may simply desire to know his child more fully, or the parent may

wish to have additional knowledge through which he can guide his own behavior as it is directed toward the child.

Examples: "I need to know why he thinks the cartoons are alive before I can deal with his misconception."

"He might be afraid of a dog or a child in the park so you have to ask him."

"I'd want to know if she understands why rules exist."

(6) Nonchild: The parent focuses on parental childrearing considerations that are not related to the development or socialization of the child. The parent's behavior as an end-product may be a goal, or the parent may focus on issues of expediency.

Examples: "I'd dress her myself. That would be the fastest way to get to the movies on time."

"I have to finish making supper."

"I've tried putting the candy on top of the refrigerator and it works."

Temporal Focus

The second criterion applied to parental rationales concerns their temporal focus. A distinction is made between parental statements that reflect an active temporal perspective and those reflecting a passive perspective. An active perspective involves placing a demand on the child to actively represent a state or event that is not directly observed by the child. The parent's goals may include either (1) a demand on the child to make a connection between different events and/or points in time, or (2) a demand on the child to represent a present, past or future state that is not evident to the child or is a nonpresent state. By definition, an active temporal perspective implies a distancing effect on the child. The child is required to go beyond the visible concrete situation and either

reconstruct the past, represent the present, anticipate the future or relate these points in time in a psychologically relevant manner.

A passive temporal mode places no demand on the child. The parent may refer to events and/or states in time (present, past, future) or to the relation between them, but the parent is not concerned with the child making connections between these temporal points. Within the passive mode, the parent himself may represent present and nonpresent states or may represent states along a temporal continuum. For example, the parent may suggest that the present state will benefit the child in the future. The parent's temporal perspective is passive in this instance. It is the parent who is thinking along temporal dimensions, not the child.

The active versus passive dimension of the parent's temporal perspective is indicated for each communication strategy goal.

Childrearing Orientation

The third criterion applied to each parental rationale concerns childrearing orientation. The inclusion of this criterion is based on the desire to investigate the relation between communication strategies and the extent to which the parent tries to be sensitive to the child's state. Since effective cognitive stimulation requires a match between environmental demands and the child's level of comprehension, childrearing orientation may be helpful in determining which parents are likely to be effective distancing agents. On the basis of inspection of the data, four possible parental perspectives have been identified: (1) Parent-centered, (2) child-centered, (3) parent role-centered, and (4) other-centered. The definitions and scoring procedure for these orientations are presented below.

(1) Parent-centered: The parent views the situation primarily from his own perspective and places emphasis on his own interests or needs. The personal priorities of the parent-as-self are considered before those of the child.

Examples: "I would play with him so he would leave me alone and I could get dinner ready."

"I want him to go to the zoo so I can be proud of him."

"I'd give her something else to do so I could have some peace and quiet."

(2) Child-centered: The parent's primary concern is in fulfilling the needs and wants of the child. The parent attempts to take the child's perspective and acts in accord with his hypotheses about the child's thinking, feeling or needs.

Examples: "I'd play with her because she must be feeling lonely to keep asking me like that."

"I would let him go if he wanted to, but I don't think I should push him if he doesn't want to go to the zoo."

"I think the child's needs should come first in the family."

(3) Parent role-centered: The parent's perspective is one of himself as the primary teacher, socializer and emotional supporter of the child. The parent is trying to fulfill expectations of parental duties and responsibilities in childrearing.

Examples: "There are certain rules a parent must lay down so the child knows what to expect."

"It's important for parents to take the opportunity to teach their child whenever the opportunity arises."

"A parent has to make sure a child eats what's good for him."

(4) Other-centered: The parent takes the point of view of a third person or of society at large instead of or in addition to his own and/or the child's perspectives.

Examples: "I don't want his friend to feel left out and sad without anything to play with."

"I wouldn't want to keep her friend and her friend's family waiting while she makes up her mind about the zoo."

"Other people aren't going to like that kind of behavior."

Situational Constraints

The fourth and final criterion applied to parental rationales concerns situational constraints. This category is used to score the inclusion or emphasis of qualifications indicated by the parent which may affect or temper the parent's response to the situation. Situational constraints may be parent-based, child-based, or setting-based.

(1) Parent-Based: This code refers to specific parent-self referents which may qualify the response to the situation; i.e., the state of the parent. A distinction is to be drawn between statements scorable as situational constraints as illustrated in the examples below and more enduring characteristics of the parent which would not be scored as such (e.g., "...since I'm generally short-tempered, I would scold him," etc...).

Examples: "If I happened to be very tired, I would give her a few candies before dinner."

"If I were happy about his behavior on that day, I would give him more attention."

(2) Child-Based: This code refers to specific child referents which may qualify the parent's response to the situation, i.e., the state of the child. Again, more enduring characteristics of the child (e.g., that he or she is only 4 years old) are not scored as child-based situational constraints.

Examples: "Maybe she's just in a cranky mood and isn't able to listen to an explanation."

"He might not want to play with the other children because he had a fight with one of them."

(3) Setting-Based: This code refers to those circumstances stemming from the setting which may qualify the parent's response to the physical situation (i.e., external factors).

Examples: "Since we live on a busy street, I have to put my foot down firmly."

"If it's very close to the time the show starts, then she just has to get dressed."

(4) Other-Based: This code refers to the parent's consideration of third persons that may influence or qualify the parent's response to the situation.

Examples: "If his friend didn't care about playing with the Legos, I wouldn't force him to share them."

"If her friend's family is waiting for her, I would tell her to make up her mind now."

The twelve hypothetical situations and the response options that accompany them are presented below.

Item 1

Billy was playing with his Lincoln Logs. A couple of logs wouldn't fit together and Billy started throwing them about the room. Father said:

____ 1. Stop throwing your blocks. It is not safe to throw blocks.

____ 2. What could happen if you throw blocks around the room?

____ 3. Since you are having trouble with your blocks, why don't you play with another toy instead?

____ 4. Please stop throwing your blocks.

Item 2

Karen and her father had earlier planned to go to the movies. It was getting late and Karen was still not ready. Father knew that Karen should be getting dressed now but Karen kept on playing. Father said:

____ 1. Let's find the new shoes that you wanted to wear today.

____ 2. You aren't dressed yet. You must get dressed now.

____ 3. You have to get dressed so we can get to the movies on time.

____ 4. Tell me why you should get dressed now.

Item 3

One day Jimmy's friend was invited over to play. Jimmy had taken out only his Lego building set to play with in the living room. He wasn't sharing any of the pieces in the set with his friend. Father said:

____ 1. Why don't you get one of your other toys to share with your friend.

____ 2. How will your friend feel without having anything to play with?

____ 3. You have to share your toy with your friend. Then you will both have something to play with.

____ 4. You have to share your toy with your friend when he comes over to play.

Item 4

David kept asking his mother to play with him. Mother told David that she was very busy right now. But David still kept asking her to play. Mother said:

____ 1. Please stop asking me to play with you now.

____ 2. Why do you think I cannot play with you right now?

____ 3. While I'm finishing my work, why don't you do a puzzle?

____ 4. Please stop asking me to play with you, I am busy with my work now.

Item 5

At Christmas time Bobby and his mother were in the living room. Bobby saw a reflection of their Christmas tree in the window and told Mother that they had another Christmas tree outside. Mother said:

____ 1. That is a copy of our Christmas tree shining in the window glass.

____ 2. That is our own Christmas tree you see in the window glass. It's just like when you see yourself in the mirror.

____ 3. If you stood in front of the tree, what would you see out the window?

____ 4. Yes, I see the tree in the window glass. But for now let's decorate our tree in here.

Item 6

Father was giving Eric a bath. Eric was playing with his cereal bowl and some other things in the tub. Eric wanted to know if his cereal spoon would float like his bowl. Father said:

____ 1. The spoon cannot float. It is metal and too heavy to float.

____ 2. I don't have your spoon here. Let's play with the toys that are here.

____ 3. What would happen if we put the spoon in the water?

____ 4. Your spoon will not float. It will sink to the bottom.

Item 7

Stephen came home with some candy from a birthday party. He wanted to eat the candy, but Mother wanted him to wait until after supper. She said:

____ 1. You can't eat the candy until after supper.

____ 2. Why don't you save your candy until after supper. You can go and play on your swing set until suppertime.

____ 3. What could happen at suppertime if you eat your candy now?

____ 4. You can't eat the candy now. You will be too full to eat all of your supper.

Item 8

Mother took Patty to the playground where she usually liked to play but Patty just stood watching the other children. Since Mother wanted her to play with the other children, she said:

____ 1. You should play in the playground so that you can have fun with the other children.

____ 2. Tell me why it might be fun to play with the other children.

____ 3. You should play in the playground with the other children.

____ 4. Do you want to leave now? You can call a friend to come and play with you at home.

Item 9

One day Father was watching Sandy build with blocks. Sandy was trying to make a tall building by stacking the blocks one on top of the other, but the building kept falling down. Sandy asked her father why the building kept falling down. Father said:

____ 1. You cannot stack so many blocks on top of one another when you make a building.

____ 2. Maybe you would like to build something lower with your blocks instead of such a tall building.

____ 3. When you stack your blocks too high, the top of the building may be shaky and fall down.

____ 4. How about telling me why you think the building keeps falling down.

Item 10

Paula had been watching cartoons on television. She told her mother that cartoon characters were alive. Mother said:

_____ 1. Cartoon characters are not alive. They are drawn like the pictures in your book.

_____ 2. Next time your cartoons are on we can see if they're alive. For now why don't you color in a coloring book?

_____ 3. The cartoon characters that you see on television are not alive.

_____ 4. How do you think cartoon characters are like pictures drawn in your books?

Item 11

Mary knew she was not supposed to go to the park by herself. One day Mother saw her leaving the yard, heading in the direction of the park. Mother called her back and said:

_____ 1. Why do you think it is not safe to go to the park by yourself?

_____ 2. You cannot go play in the park all by yourself.

_____ 3. You cannot go to play in the park because if you needed help you would be alone.

_____ 4. You cannot go to the park but you can go next door and play with your friend.

Item 12

Betty and her father were invited to go to the zoo with her best friend Ann and Ann's family. Betty's father couldn't go but he thought that Betty might have fun if she went anyway. Betty couldn't make up her mind so Father said:

____ 1. How would you feel if you want to the zoo today with Ann?

____ 2. You should go to the zoo with Ann even though I cannot go.

____ 3. You should go to the zoo without me because you'll have fun at the zoo with Ann.

____ 4. Why don't you look at the pictures of zoo animals in your book. We can go to the zoo some other time.

Scoring Key for Situation Types, Response Alternatives[a] and types of "Distancing" for the Communication Preference Questionnaire

Item	Situation	Response Alternatives 1	2	3	4
1.	F	B	A	D	C
2.	E	D	C	B	A
3.	D	D	A	B	C
4.	D	C	A	D	B
5.	B	C	A	A	D
6.	A	B	D	A	C
7.	E	C	D	A	B
8.	C	B	A	C	D
9.	A	C	D	B	A
10.	B	B	D	C	A
11.	F	A	C	B	D
12.	C	A	C	B	D

Situation Type

A. Teaching physical facts & principles: positive
B. Teaching physical facts & principles: negative
C. Promoting social skills & norms: positive
D. Promoting social skills & norms: negative
E. Behavior management: positive
F. Behavior management: negative

Response Alternatives

A. "Distancing"
B. "Rational authoritative"
C. "Direct authoritative"
D. "Diverting"

[a]Presentation orders of situation types and response alternatives are by random selection.

Construction of the Child Interview Administration and Scoring Manual

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Construction of the Child Interview

Content and Administration

There are 22 sets of probes comprising the Construction of the Child Interview. The content of each set of construction probes stems from an issue raised in each of the hypothetical situations presented for the Communication Strategy Questionnaire and Interview. Each set of probes consists of initial questions aimed at establishing the parent's view of whether or not the child has attained the concept or ability at the age in question. Follow-up questions aimed at eliciting the parent's beliefs about developmental processes that have or will lead to such an attainment are then administered (e.g., "Does a four-year-old understand time?" and "How does a child come to understand time?").

Appropriate sets of probes are administered separately for each hypothetical situation immediately after communication strategies have been discussed in full for that situation. After the parent responds to the construction probes, the next hypothetical situation is discussed for communication strategies and then for constructions of the child, and so on until all 12 situations have been completed. The 22 construction of the child probes are presented below, organized in terms of the appropriate hypothetical situation they follow.

Questionnaire Situation #1

Billy was playing with his Lincoln Logs. A couple of logs wouldn't fit together, and Billy started throwing them about the room. (3-4 year olds)

Billy was putting a model airplane together. A couple of pieces wouldn't fit, and Billy started throwing the model around the room. (6-7 year olds)

Construction probes (same for both age groups)

Say to parent: In answering these, think about __-year-olds in general.

(a) Do __-year-old children realize the consequences their own actions may have? For example, does a __-year-old know that something could get broken if they throw things around?

(Do not ask second question with 5- to 7-year-olds.)

(b) How does a child come to realize the consequences of his/her own behavior?

Questionnaire Situation #2

Karen and her father had earlier planned to go to the movies. It was getting late and Karen was still not ready. Father knew that Karen should be getting dressed now but Karen kept on playing.

Construction probes

1. (a) Does a _-year-old understand time?

(If necessary the following probe may be used.)*

Does a child know about an hour, tomorrow, a year?

(b) How does a _-year-old eventually come to understand about time?

2. (a) Do _-year-olds plan what they want to do ahead of time?

(If necessary the following probe may be used.)*

For example, does a _-year-old plan that "For now I'll watch TV and then I'm going to the movies"?

(b) How does a child become able to plan?

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*These probes are to be used only if the parent requests clarification or indicates that they do not understand the original question.

Questionnaire Situation #3

One day Jimmy's friend was invited over to play. Jimmy had taken out only his Lego building set to play with in the living room. He wasn't sharing any of the pieces in the set with his friend. (3-4 year olds)

One day Jimmy's friend was invited over to play. Jimmy had taken out only his Lego building set and had built a village. He wouldn't share any of the pieces in the village with his friend. (6-7 year olds)

Construction probes (same for both age groups)

3. (a) What makes two _-year-olds friends?

   (b) What do you think "friendship" means to a _-year-old?

   (c) How does a person get the idea of friendship that she/he has as an adult?

4. (a) Does a _-year-old realize that someone else may be feeling differently than (he)she does?

   (If necessary the following probe may be used.)*

   For example, that someone might feel sad while (s)he is happy?

   (b) How does a child come to realize other people may feel something differently from themselves?

Questionnaire Situation #4

David kept asking his mother to play with him. Mother told David that she was very busy right now. But David still kept asking her to play.

Construction probes

5. (a) Does a _-year-old know how to take someone else's point of view?

   (b) How does a child become able to take another's point of view?

6. (a) Does the child understand that her (his) parents have some duties and responsibilities that don't directly involve her (him)?

(If necessary, the following probe can be used.)*

For example, does a child understand that you must go to work, do work around the house?

(b) How does a child become able to understand this?

Questionnaire Situation #5

At Christmastime Bobby and his mother were in the living room. Bobby saw a reflection of their Christmas tree in the window and told mother that they had another Christmas tree outside. (3-4 year olds)

One night Bobby and his mother were riding in the car. Bobby was watching the moon out the window. He told his mother that the moon was following them home. (6-7 year olds)

Construction probes (same for both age groups)

7. (a) Is it important to correct misunderstandings or misconceptions a child may have about the real world? Why?

(b) Where do these misconceptions come from?

(c) Why do such ideas eventually change?

Questionnaire Situation #6

Father was giving Eric a bath. Eric was playing with his cereal bowl and some other things in the tub. Eric wanted to know if his cereal spoon would float like his bowl.

Construction probes

8. How do you think the child comes to know which things will float and which ones won't float?

9. How does a child come to know why some things float and others do not?

Questionnaire Situation #7

Stephen came home with some candy from a birthday party. He wanted to eat the candy, but Mother wanted him to wait until after supper.

Construction probes

10. (a) Does a _-year-old understand rules?

    (b) How does a _-year-old understand rules? That is, why does a child follow certain rules?

11. Where do the rules that a person follows as an adult come from?

    (If necessary the following probe may be used.)*

    How does the child eventually get rules of his(her) own, that he(she) follows on his(her) own?

12. What makes a child delay something until a more appropriate or better time?

Questionnaire Situation #8

Mother took Patty to the playground where she usually liked to play, but Patty just stood watching the other children. Mother wanted her to play with the other children.

Construction probes

13. (a) What purpose does playing with others serve?

    (b) How does playing with others accomplish this?

14. (a) Is it important for a child to be socially outgoing?

    (b) Why/why not?

15. (a) Is it ever necessary to give a child a gentle push in a certain direction?

    (b) Why/why not?

Questionnaire Situation #9

One day father was watching Sandy build with blocks. Sandy was trying to make a tall building by stacking the blocks on top of one another, but the building kept falling down. Sandy asked her father why the building kept falling down. (3-4 year olds)

One day Father was watching Sandy build with blocks. Sandy was trying to build a slanted roof on her building with the blocks, but it kept falling down. Sandy asked her father why the building kept falling down. (6-7 year olds)

Construction probes (same for both age groups)

16. What role do you think frustration may play in learning?

(If necessary, the following probe may be used.)*

Is it ever OK to allow a child to become frustrated?

When? Why?

Questionnaire Situation #10

Paula had been watching cartoons on television. She told her mother that cartoon characters were alive. (3-4 year olds)

Paula had been playing with her toy animals. She told her mother that her toy monkey was alive. (6-7 year olds)

Construction probes (same for both age groups)

17. (a) Do you think children ever think that inanimate objects like a rock or a tree have feelings and thoughts?

(b) Where do you think these ideas come from? or Why doesn't a child ever have such ideas?

(c) (If appropriate) Why do ideas like this change?

18. What makes a child come to realize some things are alive and others are not alive?

Questionnaire Situation #11

Mary knew she was not supposed to go to the park by herself. One day mother saw her leaving the yard, heading in the direction of the park.

Construction probes

19. (a) Is it all right to allow a child to exert his/her independence instead of following a rule(s) he usually follows?
    (b) Why/why not?
20. (a) Does a _-year-old know when to be independent and when to follow a rule?
    (b) How does a child come to know when to follow rules and when to be independent?

Questionnaire Situation #12

Betty and her father were invited to go to the zoo with her best friend Ann and Ann's family. Betty's father couldn't go but he thought Betty would have fun if she went anyway. Betty couldn't make up her mind.

Construction probes

21. (a) Should children make their own decisions?
    (b) Why/why not?
    (c) On what do they base their decisions?
    (d) How do they work out problems when they want to do two things at the same time?
22. (a) What makes a child act on his(her) own?
    (b) What makes a child independent?

Administration of these probes should follow the order presented above in all cases except the following: If the parent says the child "learns," "sees," or that changes are due to "socialization," "experience," or "individual differences" the interviewer must probe for an explicit process. The following probes are acceptable.

"Can you tell me what you mean by_____?"

"How does_____accomplish this?"

"Can you tell me more about_____?"

Coding

The Construction Interview coding is separate from the Communication Strategy Interview. The coder first listens to the entire protocol for a particular set of construction probes. The coder then listens again to the parent's statements in response to each construction probe.

The parent's verbalizations are scored for frequency and intensity of reference to each of 16 constructs of child states and processes. Any construct that is not referred to is assigned a score of 0. Those constructs that are included, but with less frequency or intensity than others, receive a score of 1. The primary or dominant constructs expressed in parental statements are scored with the numeral 2. Whenever a parent refers to only one construct, that construct receives a score of 2. The coder may relisten to the parent's statements either in part or its entirety as often as necessary. The constructs used for this portion of coding are defined below.

ABSORPTION

The process of incorporating or taking into an existing system without transformation to a new or different form. Active processing of information by the child cannot be implied. Constructs that do include internal processing by the child in their definitions will subsume "absorption" constructs. That is, if constructs of "accumulation," "cognitive processes," "experimentation" or "self-regulation" are coded, any references to "absorption" included in the parental verbalization is ignored. Parental references to the "child's experience," "being in a specific situation," "having it happen to them," "learning by doing" when not further probed for explicit child processes are included in the definition of "absorption."

Examples: "When a child plays with lots of things in the bath, he will know which things will float and which won't from his experiences." (has not specified an internal process)

"When a child hears a rule, the rule will sink in."

ACCUMULATION

The parent refers to an increase or growth in knowledge, or behavioral, social and affective skills that occurs by addition. Repeated actions, observation, practice and repetitions that are seen as necessary for attainment or proficiency in any area are consistent with this construct. References such as "it's a constant process," "experiences over time," "past experience" and multiple experiences are consistent with the definition of "accumulation."

Examples: "If children do it over and over, eventually they will learn how to do it right."

"If the child hears the rule often enough, then eventually it will sink in."

"Each time a child plays with a toy in the water, he learns whether it can float or not. All these experiences with things that float build up his ideas of which will float." (also code "exposure")

"The more kids a child plays with, the more ideas he can get about what other people are like." (also code "exposure")

"Children know from their past experience when it's OK for them to act on their own and when they should follow rules."

"Children should make some of their own decisions now so that when they're older they can handle bigger, more important decisions."

"Misconceptions can really get in the way as their experiences grow and their knowledge grows."

"And once they go through this for a period of days or weeks, they learn to accept it and take it as a routine part of life."

"As their experience grows, their knowledge grows."

"Children learn to follow rules because parents tell them the rules a lot" (also code "direct instruction")

COGNITIVE PROCESSES

The parent refers to the child's ability to transform information internally, draw essential underlying principles from a particular object/event or make inferences and judgments. References to invention, creativity, discovery, formulation, observation leading to judgments, conclusion, logical thinking and reasoning, generalization, abstraction, cognitive reorganization and integration of information imply internal cognitive processes.

Examples: "Children figure things out on their own."

"Four-year-olds make decisions by weighing all the alternatives."

"Children understand why things float from figuring out what the characteristics are of objects that do float versus those that sink."

"Children get their ideas about time by using their own thinking and imagination and changing these ideas as they have new experiences."

"They can look at situations in different ways and not just take them at face value."

"These ideas/misconceptions come from inside the children's heads...from their own imaginations."

"The child thinks things have feelings and thoughts because they know they do and just expand this to everyone and everything, thinking they're just like him."

DEFICIENCY

The parent views the child as <u>incapable of developing</u> in a cognitive, social or affective area. Changes in this condition are seen as unlikely to occur unless special efforts towards remediation are undertaken by parents or other adults.

Examples: "There is no way a child is going to understand why things float. I don't even understand it."

"Some children are not able to interact with other children. They are basically very shy and will be all their lives."

"Children who do not understand what you say to them won't understand rules unless they're helped with language."

DIRECT INSTRUCTION

The act or process of conveying/giving the reason for or the cause of. A direct presentation of facts or information is involved. Processes internal to the child are de-emphasized. References to showing, telling, explaining and/or teaching should be coded as direct instruction.

Examples: "Children won't learn about flotation until they have science in school."

"If you explain the rule to the child, then he will understand why he can't go to the park himself."

EXPERIMENTATION

The act or process through which the child applies some idea or behavior to a situation (physical or interpersonal), receives feedback from some object/person, and then modifies his behavior in some way, receives feedback and so on. Curiosity leads to experimentation which leads to the attainment of some concept or skill (behavioral or social). References to trial and error on the part of the child are coded as "experimentation."

Examples: "Play is important because it gives the child the opportunity to test out different rules and see what works with others and what doesn't."

"Children learn to persevere under frustration by experimenting with different solutions until they find one that works."

"All children are basically curious. They test the limits of rules that are laid down for them."

"Children learn through trial and error."

"Children learn about floating by dropping lots of things in the water and seeing whether they float or not."

EXPOSURE

The parent refers to the presentation or existence of a social or physical object in the presence of the child. The child sees or notes such an occurrence but there is no reference to internal processing or transformation of such information. If an inference or judgment on the child's part is implied, do not code "exposure" (see "cognitive processes"). Exposure to other children through interaction, joint activity, spending time together, without indicating process. References to "interaction," "joint activity," "spending time together" or "experiential learning," without further explanation of how the child processes this experiences are coded as "exposure."

Examples: "Children who are around lots of other children their own age make friends easily."

"Seeing things in the bathtub or going to the ocean give children the experience of seeing which things float and which don't."

"Children see their parents go to work so they accept the fact that they do have to go."

"I suppose just being in each others' presence, running around with each other, cycling in the neighborhood--it all goes into making friendships."

"Children pick up misconceptions from TV, books and other children."

"To a four-year-old, friendship means having someone to play with."

IDENTIFICATION

The parent thinks that children fuse their own inner states with other persons or objects. Such a transference may be automatic and cognitive processes are not necessarily involved. The child's tendency to become similar or to incorporate traits of another person or group through modeling or imitation are included under this construct.

Examples: "Children learn to plan by seeing the way their parents plan for things. They learn by example."

"When someone else feels sad, he starts to feel that way too."

"All a child has to do is see someone else crying and he'll start crying himself."

"Children will take the same rules and values as their parents because they want to be like them."

IMPULSIVITY

The child tends to act on sudden spontaneous inclinations or incitement to unpremeditated action. Impulsivity implies a lack of systematic or planned control over one's own behavior. The spontaneity in behavior may be age-related or specific to an individual's personality and is not necessarily considered a deficiency on the part of the child.

Examples: "Rules are important because they help keep the child from doing whatever he wants immediately."

"Children don't think (plan) about what they say (do). They just do whatever pops into their heads at the instant."

"Six-year-olds don't really plan. I think their behavior is rather spontaneous."

"It's OK to allow the child to become frustrated because in the next minute they'll be distracted and into something else anyway."

"Children make decisions based on what they feel like doing the most" (no specification of how the child reached a conclusion or engaged in planned control).

INNATE FACTORS

The parent refers to inborn characteristics or to a gradual or spontaneous emergence of a characteristic/skill/concept that occurs through natural growth rather than through any particular activity on the child's part or any particular environmental contingency. The implication may be that some characteristic or concept unfolds as the child ages, or a characteristic is present/absent due to inheritance. The emphasis should be on the influence of time on the child. It is not simply that time goes by, but that the child is growing older or is being changed in some way by the passage of time. (See accumulation for references to the effect of passage of time in terms of accumulation by addition.)

Examples: "All children are unique. They are individuals from the moment they're born."

"Children are either shy or they are outgoing by nature."

"Some children are simply born smarter than others."

"Children don't understand the concept of time until they are older" (with no reference to any process on the child's part).

"Children should be able to share by the time they are that old."

"As you get older and situations change, the people you identify as friends also changes."

"Children are basically social beings because man is gregarious."

MANIPULATION OF ENVIRONMENT

The parent refers to a purposeful control by a person over the surroundings or activities of the child that serve to guide and structure experiences of the child in an organized manner.

Examples: "Parents should encourage children to go out on their own to foster independence, but at the same time protect the child from dangerous situations."

"A little frustration is okay, but you have to step in sometimes and help him see the answer before he gives up."

"Even though we limit what he watches on TV, it's still a big influence on him" (also code "exposure").

"Children have to play with other children, so you have to set up situations where it is possible without pushing the child."

"Children learn to be independent when their parents allow them to be, by letting the child make some decisions on their own."

"The way they're raised. Their upbringing" (when not probed for specific processes in childrearing).

"Children should make decisions, but you should limit the choices."

NEGATIVE FEEDBACK

The parent refers to an unpleasant state produced in the child which serves to inhibit or to motivate subsequent behavior. Negative reinforcement and punishment are both included as part of this construct as they provide a means through which negative consequences of behavior is indicated to the child.

Examples: "Children obey rules out of fear of being punished."

"Children learn to take other people's point of view because when they don't it leads to negative consequences."

"If he misses the school bus he'll realize he has to leave the house earlier."

POSITIVE FEEDBACK

The parent refers to a positive state produced in the child or a positive external consequence of the child's behavior that may serve to motivate the child, provide information and feedback to the child or make

a behavior more likely to reoccur. Positive feedback includes references to positive reinforcement and may involve administration of a physical reward to the child, approval following some expression or behavior, or feelings of enjoyment, success or self-approval on the child's part following some behavior.

Examples: "Children obey rules because they want the approval of their parents."

"Whenever a child tries something new and is successful, he will be more likely to explore new things in the future."

"Friendship to a 6-year-old just means having a good time together."

"Children make decisions based on what is the most fun" (implies that child engages in behaviors that provide enjoyment or positive feedback).

SELF-REGULATION

An internal governing and controlling process resulting in systematic order and coordinated actions and behaviors; a mechanism through which a balance or state of equilibrium is achieved or maintained between child and environment (objects or persons). Children are capable of governing or exercising control over their actions, thoughts or development. The child's intrinsic motivation and seeking/obtaining a balance or match with the environment are included under this construct.

Examples: "Children become friends with those with different personalities so they complement each other."

"Parents don't have to push their children. A child will be motivated to seek those experiences that are necessary for him to learn."

"Children can go off by themselves and have a good time without their parents."

"For the child to know when to be independent and when to follow a rule, a balance has to be established between knowing what he wants to do, and what he has to do."

"A child has friends who are similar to himself in like and dislikes. This is why some 6-year-olds get along so well together and others just don't mesh in the same way."

STAGE

A period or step in a progression, activity or development; a period of time that has one or several characteristics that make it distinctive (such as egocentrism); a necessary level of mental or physical readiness or skill before the child is capable of some experience, knowledge or action. References to phases, sequences, stages, critical periods, readiness are coded under the "stage" construct.

Examples: "A child can only understand which things will and won't float after he understands about weight. He has to know these things before he will reach an understanding of why things float."

"Children first understand rules only in terms of what they can and cannot do. On the basis of this, they come to understand the reasons behind the rules and then they come to understand why there are some exceptions to every rule."

"All children go through a time when they don't want to share. It will pass eventually."

"Young children are pretty dependent on their parents but eventually they will get more and more independent."

"The child will learn this concept when she is ready."

"Six-year-olds can't understand someone else's point of view. They're very self-centered at six."

STRUCTURE IN THE ENVIRONMENT

The parent refers to an organization inherent in particular events, circumstances, objects, persons or conditions that act upon and influence the child. This organization is not a result of purposeful action on the part of significant others in the child's environment (see Manipulation of Environment), but is seen as existing for the world as a whole. The process of forming mental connections or bonds between sensations, ideas, behaviors, etc. by virtue of the fact that events occur together are also included as part of the structure in the environment.

Examples: "Going to bed at night and getting up in the morning helps the child to come to understand about time."

"She realizes that on certain days you do certain things. She gets in a routine."

"He knows from the expression on my face that I'm mad because he associates that look with my being mad."

"They know about an hour because that's how long Sesame Street is on."

After each probe is scored for the appropriate construct(s), the coder rates the parent's constructions on a four point Likert-type scale that ranges from (1) the child is a passive recipient of knowledge information; knowledge exists external to the child, to (4) knowledge is a result of active processing on the child's part; mechanisms responsible for learning and development are internal to the child. Constructs which reflect a passive orientation are: innate factors, exposure, and absorption. Less passive constructs are direct instruction, structure inherent in the environment, negative and positive feedback, manipulation of the environment,

accumulation and impulsivity. Constructs which reflect an active processor are: cognitive processes, experimentation, self-regulation and identification. Deficiency and stage constructs may vary along the entire active-passive dimension, depending upon the other constructs that occur in conjunction with them.

After the 22 sets of probes have been coded for particular constructs and active-passive dimensions, the coder sums the total number of constructs scored across all probes. In addition, the confidence expressed by the parent in his/her beliefs about children are indicated on a Likert-type scale ranging from very uncertain (1) to very certain (4).

Family Influences on Childrearing Interview (FICI)

Administration and Coding Manual

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FAMILY INFLUENCES ON CHILDREARING INTERVIEW (FICI)

ADMINISTRATION AND CODING MANUAL

Overview

In the Family Influences on Childrearing Interview (FICI), parents are questioned with regard to: (1) their beliefs about their own child's development (as opposed to developmental processes in general), (2) their expectations of their children's capabilities, (3) the time that they spend with each of their children individually, (4) their beliefs about their child's special needs, and (5) the allocation of family resources to individual family members. Each of these aspects of the interview will be presented separately in the sections that follow.

Beliefs about own Child

Administration

After the twelve situations comprising the CBQI have been discussed, parents are introduced to the FICI as a whole, and to the particular section of the interview which deals with their ideas about their own child's development. The introduction is as follows:

Up to now we've been talking about 4- (or 6-) year-olds in general. There are a lot of differences between different children so now we want to know about your child _____ (insert name of target child), in particular.

Three of the CBQI situations are then presented again to the parent, but probes are directed at parent's assessments of their own child's capabilities and at parents' beliefs about the processes by which their own child's learning occurs. The three situations selected are representative of the

initial twelve, in that one is a teaching situation, one is a personal/social situation, and one is a child management situation.

The following probes are administered immediately after the introductory statement:

1a. Does _____ (insert name of target child) understand time?

(If necessary ask: Does he/she know about an hour, tomorrow, a year?)

If NO:

1b. How do you think he/she will eventually come to understand about time?

If YES:

1c. How did he/she eventually come to understand about time?

2a. Does _____ (insert name of target child) realize that someone else may be feeling differently than he/she does?

(If necessary ask: For example, that someone might feel sad while he/she is happy?)

If NO: How will } he/she come to realize other people may feel something differently from him/herself?
if YES: How did }

3a. Does _____ (insert name of target child) know when to be independent and when to follow a rule?

3b. How will/did he/she come to know when to follow rules and when to be independent?

Coding

This portion of the FICI is coded by the same person who codes the Construction of the Child Interview. Comparisons are made between the parents' responses to these questions for their own child and their responses to the same item administered as part of the Construction of the Child Interview. Separate comparisons are made for the state or level of development and the developmental processes indicated by the parent for each of the three situations. In addition, the parents' ideas about the developmental processes through which their own child learns about time, perspective taking and independence/rules are rated on a scale measuring how active or passive a role the child is playing in his development.

Comparison State--Responses to FICI versus Construction items: One of four possible responses may be coded to indicate the level of development the parent believes his own child has attained (FICI) and the level of development he/she believes to be typical of children that age (Construction): "Yes," "No," "Mixed," "No answer." A "Yes" response should be coded if the parent believes the child has the ability described in the question, i.e., understands time, realizes someone else may be feeling something differently than he/she does, knows when to be independent and when to follow rules. Code "No" if the parent believes the child does not have the ability described. A "Mixed" response is one in which the parent indicates the child has the ability/concept to some extent, but not fully. In other words, the child is still in the process of attaining the ability/concept. The "no answer" category is reserved for cases

where the parent does not respond, or the interviewer omits the question.

Comparison Processes--Responses to FICI versus Construction items: In making the comparison between constructs of development on the FICI and Construction of the Child, the coder refers to constructs already coded for the Construction interview and compares these to constructs given on the FICI along a 5-point scale ranging from (0) Totally different to (3) Exact match. (A "No answer" category is included to cover instances where the parent did not respond.) Coding follows instructions provided in the Construction of the Child Manual. If none of the developmental constructs coded from the construction interview match those given in response to the FICI item, "(0) Totally different" should be coded. By the same token, if all of the developmental constructs coded from the construction interview match the constructs from the FICI, "(3) Exact match" should be coded. When the constructs differ by one or two conceptually similar constructs, but at least one construct is the same, code "(2) More alike." When one construct is the same, and there are one or two conceptually dissimilar constructs, code "(1) More different" (see code sheet, pp. 34-39).

Active-Passive Scale: The developmental processes (constructs) through which the parent believes his/her child attains each of the abilities/concepts in the three situations are coded along a 4-point Likert-type scale. The scale varies along the dimension of the child's role in the attainment of knowledge. It ranges from a score of 1 to 4, with a 1 indicating that the parent believes that knowledge

exists external to the child, with the child being a passive recipient of information/knowledge, and a 4 indicating the parent's belief that knowledge is a result of active processing on the child's part and that mechanisms responsible for learning and development are internal to the child.

Coding of parents' responses along the active-passive dimension on the FICI is done following the same coding system used for coding active-passive responses on the Construction of the Child interview.

Constructs which are defined as passive are:

Innate factors

Exposure

Direct instruction

Absorption

Structure in environment

Negative feedback

Positive feedback

Manipulation of environment

Accumulation

Impulsivity

Indentation of the above constructs indicates relative positioning along the active-passive scale within the passive category, i.e., constructs which are further to the right are less passive.

Constructs which are defined as <u>active</u> are:

Cognitive processes

Experimentation

Self-Regulation

Identification

Constructs which are further to the left are less active. The two remaining constructs, Deficiency and Stage can vary along the entire active-passive dimension.

Some rules to guide assignment of active-passive scale scores (A/P) are as follows:

If innate factors, exposure or absorption are coded alone, A/P = 1

If innate factors, exposure or absorption are coded in conjunction with other constructs, A/P cannot exceed 3

If cognitive processes and self-regulation are coded alone, A/P = 4

If cognitive processes and self-regulation are coded in conjunction with other constructs, A/P cannot be less than 2

Direct instruction, structure in environment, negative or positive feedback, manipulation of environment, accumulation and impulsivity are more easily pulled toward active end than other constructs

Experimentation and identification are more easily pulled toward passive end than other constructs.

Examples for coding combinations of constructs follow. It should be noted that these are examples, not rules. Actual ratings

on the A/P dimension should include consideration of intensity of references to constructs.

Cognitive processes + Experimentation = 4

Cognitive processes + Innate factors/Exposure = 3

Cognitive processes + Negative feedback/Positive feedback = 2 or 3 or 4

Cognitive processes + Accumulation = 3 or 4

Cognitive processes + Structure in environment = 3 or 4

Cognitive processes + Manipulation of environment = 3

Experimentation + Innate factors/Exposure = 2 or 3

Experimentation + Structure in environment/Accumulation = 3 or 4

Experimentation + Manipulation of environment = 2 or 3

Innate factors/Exposure + Direct Instruction = 2

Innate factors/Exposure + Structure in environment = 1 or 2

Innate factors/Exposure + Negative feedback = 1 or 2

Innate factors/Exposure + Positive feedback = 1 or 2

Innate factors/Exposure + Manipulation of environment = 1 or 2

Innate factors/Exposure + Accumulation = 2 or 3

Structure in Environment + Positive feedback/Negative feedback = 2

Structure in Environment + Accumulation = 2

Differences/Similarities Between Children

Administration

In this next part of the FICI, parents are asked about changes in their beliefs about the capabilities of 4- or 6-year-old children in general, their expectations about their own children's capabilities, and parents are also asked to compare their children.

The interviewer introduces these questions by saying:

Now I'm going to ask some questions to help us focus on what you expected children to be like and how your children may be similar or different from these ideas.

The following probes are then administered:

1. Have your ideas about what four-/six-year-olds in general are capable of doing and thinking changed in any way from before you had (a) child(ren) to after you had (a) child(ren), or have they been pretty much the same all along?

The interviewer continues with the following questions for parents of more than one child. For families with an only child, probes (2), (3), and (4) are omitted. For families in which the target child is first born or second born, the probes are administered exactly as they are presented below. However, for families in which the target child is in the third or later ordinal positions in the family, comparisons are to be made between the target child and the next older sibling in the family.

2a. In your own family, do you have different expectations about these things we've been talking about for _____ (insert name of target child) than you had for _____ (insert name of older child) at this age?

2b. Why are your expectations different/the same?

3a. Do you think _____ (insert name of older child) and _____ (insert name of target child) are more like one another or more different?

3b. Why do you think they're so alike/different? (If necessary ask: How do you account for the differences/similarities?)

Probe individual differences ("all children are different"), "Personality" make-up, etc. "Where do these differences come from?"

4. When _____ (insert name of target child) was little, which did you expect them to be, alike or different?

Coding

Parents' responses to probes (1) and (2a) are coded into one of five categories:

Same: expectations of what 4- or 6-year-olds are capable of thinking/doing remained stable over time

Different: expectations have changed

Mixed: expectations have remained the same in some respects and have changed in others

None: no expectations about children existed prior to parenthood

No answer: the parent did not answer the question

Probe (2a) involves rationales for same/different expectations. Nine categories are used for coding rationales. If the parent refers to more than one type of rationale, code the category that occurs closest to the top of the following list of categories. Thus, only one category can be coded in response to each probe.

Unique needs of one child: Child has communication handicap, child needs more time to learn things.

Individual differences in children: All children are different, all children are individuals, personality differences.

Sex differences: Same or different expectations are due to differences attributed to sex.

Parent has changed: The experience of raising the first child led to a change in the parent, such as being more relaxed with the second child, not being as strict with discipline, or having a different attitude toward raising children. The parent may handle situations differently with the second child as a result of the first child being a "guinea pig" for the parent.

Parent has remained the same: The parent is raising both children the same way, tries to treat both children equally, doesn't favor one above the other, disciplines both children consistently.

All children basically alike: Can expect pretty much the same from both children because all children are basically alike; they can do the same things at a given age, and develop at the same rate.

No expectations before had children: Parent never thought about what children would be like before having children; didn't have much contact with young children before having own children and therefore did not know what to expect.

Other (indicate): If parent's response does not fit into any of the above categories, indicate what parent said.

No answer: Parent did not respond, or interviewer omitted question.

Parental comparisons of children (in response to probe 3a) are coded into one of four categories:

Same: the two children tend to be alike/similar to one another.

Different: the two children tend to differ from one another.

Mixed: the children are alike in some ways, different in some ways.

No answer: the parent did not answer the question.

Reasons given for similarities/differences (probe 3b) are coded into one of five categories:

Genetics: Differences/similarities due to heredity; children were just born that way; parent knew from Day One, from the moment they were born. Also code genetics if the parent stated that he or she raised both children the same way and

cannot otherwise account for the similarities/differences between them.

Environment: Parent's reason for similarities/differences between children involves the way children were raised, the child's relative birth order position (and therefore the family environment), peer influences, etc.

Both: Similarities/differences between children attributed to an interaction between genetics and environment; parent believes children born with certain predispositions or personalities which are influenced by the way parents raise children.

Other (indicate): Reasons other than genetics, environment, or an interaction of the two, should be indicated. Similarities differences attributed to personality, individual differences, or psychological make-up, are to be coded in this category.

No answer: If parent cannot account for the similarities or differences, doesn't know where the similarities/differences came from, or if the question was omitted by the interviewer, code "No answer."

Parents' responses to probe (4) are coded into one of five categories:

Same: expected the children to be alike.

Different: expected the children to be different.

Mixed: expected the children to be similar in some respects and different in others.

None: no expectations about child before his/her birth.

No answer: fails to give an answer.

Changes in Time with Each Child

(omitted for only-child families)

The interview introduces this portion of the interview in the following manner.

Now I'll ask some questions focusing on the time you spend with each of your children individually. For example: you and _____ (insert name of first-born); then you and _____ (insert name of second-born); then you and _____ (insert name of third-born). If parent questions this, probe with "We're interested in the time you spend individually with each child."

Parents are then asked to make the following comparisons with regard to the time they spend with their children:

1a. Is the amount of time you now spend with _____ (insert name of first-born) more, less, or the same since before _____ (insert name of second-born) was born?

1b. If not the same: Why has it changed?

If the target child is in the third or a subsequent ordinal position, the name of the target child is substituted for the second-born and the name of the older sibling closest in age to the target child is substituted for the first-born.

2a. Is the amount of time you now spend with _____ (insert name of second-born) more, less, or the same as the amount of time you spent with _____ (insert name of first-born) at this age?

2b. If not the same: Why has it changed?

The following probes are administered to families with 3 or more children. If the target child is in the third or a subsequent ordinal position, the name of the target child is presented first and compared to the child who is in the next (younger) ordinal position.

3a. Is the amount of time you now spend with _____ (insert name of second-born) more, less, or the same since _____ (insert name of third-born) was born?

3b. If not the same: Why has it changed?

Coding

For each comparison that applies, code whether the time spent by the parent is more, less, or the same, or no answer was given.

Rationales given by the parent to explain why the amount of time spent has changed are coded separately, depending on whether the amount of time is more or less. However, as many of the rationales apply in either case, each will only be defined once.

CODE AS MANY RATIONALES AS ARE APPLICABLE

More children: Parent has to divide time, attention, energy, among more children than before.

Group time with both children: Parent spends time with both children together; reads them both a story, or takes them both to the zoo. (Note that this is not really an answer to the question, as parent was asked about the time spent

individually with each child).

More child-related duties/Change in child-related duties: There has been a change in the amount of laundry, dishwashing, house cleaning, etc. to be done.

Duties outside the home/Change in duties outside the home: Parent is now occupied with duties and responsibilities outside the home which detract from time available to spend with child or was previously occupied with these kinds of duties and responsibilities. A few examples of responses to be coded in this category include: duties related to the parent's job, the parent is working and going to school, parent's job involves a lot of time on the road, parent is involved in the PTA or other organizations.

Needs of first-born (OR older sibling) greater than needs of second-born (OR target)--focus on age: Parent feels first-born is old enough to understand and therefore spends time responding to the child's curiosity with explanations. Since older child is in school, he or she needs the parent's help with homework assignments or special projects. Parent feels that first-born needs extra time and attention to adjust to the birth of a new sibling.

Needs of second-born (OR target) greater than needs of first-born (OR older sibling)--focus on age: Since second-born is younger, he or she still needs help getting dressed or help tying his or her shoes. Second-born is home all day

with parent and wants parent to play, or needs parent to structure day.

Needs of second-born (OR target) greater than needs of third-born (OR younger sibling)--focus on age: Second-born needs more of parent's time because of adjustment to the birth of a new sibling. Third-born is only an infant and doesn't need much more than a diaper change and a bottle, while second-born is older and curious about the world, his or her mind is developing rapidly and parent wants to spend time explaining things and guiding the child's development.

Needs of third-born (OR younger sibling) greater than needs of second-born (OR target)--focus on age: Since third-born is younger, he or she still needs help getting dressed, or needs to be played with. Third-born still needs parent to do things for him or her while the older children can do these things by themselves.

Parent ability to relate to child increases as child grows older: Parent finds him/herself more interested in becoming involved with the child as the child grows older, develops more of a personality and develops the ability to interact with others.

First-born (OR older sibling) in school, plays with friends, etc. more than before: The first-born child is simply not around as much as before. He or she is now off at school, or is playing with friends, participating in after-school activities, etc.

First-born (OR older sibling) in school, plays with friends, etc. less than before: The first-born is around more than before, does not play with friends or participate in after-school activities as much as before.

Second born (OR target) in school, plays with friends, etc. more than first-born did: The second-born child goes off and plays with friends more than the first-born child did at that age. The second-born child is busy all morning in nursery school, whereas the older child didn't go to nursery school.

Second-born (OR target) in school, plays with friends, less than first-born (OR older sibling) did: Second-born goes to school for only half a day now while first-born was in school all day by this age, or second-born plays with friends less than first-born, or doesn't participate in library story hours, etc. as much as first-born did.

Second-born (OR target) in school, plays with friends, etc. more than before (for comparison with third-born): Second-born is now in a play group, or nursery school, or plays with friends more than before.

Second-born (OR target) in school, plays with friends, etc. less than before: Second-born does not play with friends as much as before.

Unique needs of first-born (OR older sibling)--focus on individual differences: Parent spends time with first-born in order to work on development of language skills.

First-born may be more dependent on parent or more "clingy"--seems to need to be with parent more. First-born having trouble in school and needs parent's help.

Unique needs of second-born (OR target)--focus on individual differences: Same as above for first-born.

Unique needs of third-born (OR younger sibling)--focus on individual differences: Same as above for first-born.

Novelty of having children has worn off: Parent spends less time with child following first-born because the novelty of watching a child's development, e.g., first word, first step, etc. has worn off after experience of first child.

Not applicable/None of the above (indicate): If none of the above categories can be coded, please indicate the response given, and whether it was to the first, second, or third comparison.

Needs of the Child

Administration

In this part of the FICI, the parent is questioned with regard to his/her child's special needs and the factors to which the parent attributes these needs. The procedure is as follows:

We want to know what you think about _____ 's (insert name of target child) needs.

1. Do you feel _____ (insert name of target child) has special needs? (Probe "No" or "all children have special needs" one time.)

2. What do you think is the major need? (Or if parent has discussed a need in response to question 1, ask: "Do you think that this is _____ 's major need?")
3. How do you account for this need? (Probe individual differences, personality, make-up) "Where do these differences come from?"
4. Do you think this _____ (insert major need) is permanent or that he'll/she'll outgrow it?
5. Do you think it could be changed with special help?

Coding

Responses to probe (1) are coded as yes, no, all children have special needs or no answer. Only one need can be coded for probe (2). Needs are coded according to type (4 categories) and whether the parent considers the needs as positive or negative. Positive needs may include parental references to strengths or desirable attributes of the child in a particular realm of development, while references to weaknesses or deficiencies in the child are to be coded as negative needs. Several examples follow, which should help in differentiating positive and negative needs and in determining the area of the child's development in which the need is present.

Language

Positive--Child enjoys speaking, likes to communicate ideas to others, and needs to have the parent give him/her the opportunity to talk about activities at school, etc.

Negative--Child has communication handicap and needs parent to work with him or her on language skills, or needs parent's help to prepare for speech therapy session, etc.

Personal/Social

Positive--Child needs love, attention, affection, close emotional/physical contact with others.

Negative--Child has excessive need for love and/or attention; child has difficulty interacting with others, is shy, withdrawn, or overly sensitive.

Cognitive

Positive--Child is very bright and needs to be challenged in school. Child is very curious and eager to learn and needs to be in an intellectually stimulating environment.

Negative--Child has difficulty keeping up with classmates at school, or has a learning disability, and needs help with schoolwork.

Physical

Positive--Child is very athletic and needs to be involved in sports to further develop talent in this area.

Negative--Child is weak or physically uncoordinated and needs to be encouraged to participate in physical activities.

If a need is expressed which does not correspond to any of the above areas, code "other" and indicate the parent's response and whether the need was positive or negative in the spaces provided. If the question was omitted by the interviewer because the parent stated that his/her child had no special needs, code "no answer."

The source of the need indicated by the parent in response to the third probe is coded into ONE of the following categories:

Genetics: Parent states that the need is hereditary, the child was born that way, or that the need is part of the child's nature or is inherent to all humans.

Maturation (developmental lag/acceleration): Parent believes the child's need may be attributed to an accelerated or delayed rate of development.

Environment--Other than family: Child's need attributed to environmental influences external to the family, such as interactions with peers and/or teachers, and societal influences as a whole.

Environment--family: Aspects of the family environment, such as the way the child was raised, the child's relative birth order position, interactions with parents or siblings, or conditions in the home as a result of parents' work or school responsibilities are considered to be the sources of the child's need.

Both genetics and environment: Parent states that the child's need is due to an interaction between genetics and environment, or mentions both factors in his/her response.

Accident after birth: An accident, such as a fall, is considered to be the source of the child's need.

Prenatal cause: Illness of the mother during pregnancy, or an accident suffered by the mother during pregnancy is the source of the child's need.

Illness of child: Parent feels that an illness suffered by the child is responsibile for the child's need.

Religion, fate, karma, etc.: Reason for child's need is spiritual/religious in nature.

Other (indicate): Reason given by the parent is other than those indicated above. Language problems attributed to hearing losses are to be coded in this category.

No answer: Question omitted by interviewer.

Parents' responses to probe (4) are coded into one of two categories:

Permanent (hope won't outgrow): The parent believes that his/her child will always have this need. If the parent states that he/she hopes the child won't outgrow this need, it is considered to be implied that the parent believes the need is permanent. Responses that the child will always have the need but will learn to adapt to it, cope with it, transfer it to other relationships, etc., are to be coded in this category.

Nonpermanent (hope will outgrow): If the parent states that the child will outgrow the need in time, or that he/she hopes the child will outgrow it, code these responses in the nonpermanent category. Also code responses that the child will improve.

Categories for coding responses to the fifth probe include parents' beliefs that their child's need will change with special help, won't change with special help, that no change is needed, or that change will occur without special help.

ONLY ONE OF THESE RESPONSE CATEGORIES IS TO BE CODED

If the question was omitted by the interviewer, or if the response given does not correspond to any of the above categories, code no answer.

Allocation of Family Resources

Administration

Questions in this part of the FICI deal with the ways in which family resources such as money and personal energy are distributed as well as the ways in which financial decisions are made for the family. The probes below are administered in the following order:

1. Given that every family has a limited amount of money available after you've taken care of the household expenses, how do you distribute this money to meet the various needs of each family member? How would you rank each family member with "1" getting the most, then "2" getting less and so on? Read off (or) Tell me how you'd rank them.

   Hand card to parent with list in this order:

   Yourself

   Your spouse

Children listed individually from oldest to youngest

Other people (like parents)

2. There are many decisions a family makes regarding how it spends its money. I will list areas that most families have to consider. Please tell me whether it is you or your spouse who makes the major financial decision for:

    1. clothing for the family
    2. purchase of a car
    3. entertainment/recreation
    4. responsibility for budget making
    5. household furnishings
    6. vacations
    7. food
    8. household maintenance and repair
    9. special activities for children
    10. putting money in savings

3. Can you imagine any circumstance in which you would be willing to spend a lot of money on _____ (insert name of target child) and not on the other members of the family?

    If YES: What circumstance?

4. Given that every parent has a limited amount of energy available after that required by your job and the house, how do you distribute your energy to meet the various needs of each family member? Tell me how you'd rank them.

(Use the same card of rankings as Question 1.)

In the event that a parent asks for further clarification of what is meant by household expenses (Probe 1), the interviewer is to inform the parent that we are interested in how the money actually gets distributed after the basic necessities of food, clothing and shelter are out of the way. (No references to "fun money" or "leftover money" should be made on the part of the interviewer, as that would be misleading.

The last entry on the card "other people (like parents)" should <u>not</u> be probed if the parent does not include other people in the ranking. It is up to the parent to include them, and the parent's decision would be influenced by probing.

If the parent is unable to do the ranking, the following probes may be used:

(1) "Of course this could change from time to time, but how does it usually get distributed?" (focus on the practical, actual distribution of financial resources).

OR

(2) "We're not asking whom you would prefer to spend money on, or which family members you favor most, but rather, how does the money actually get distributed?"

Information regarding assignment of equal or shared ranks should not be given by the interviewer unless the parent requests it.

Coding

Indicate the rank order position assigned to each family member in response to probes 1 and 4 in the space provided on the score sheet. This requires knowledge of the names of all of the children in the family and their birth order. Special attention to names and birth order should be given to families with three or more children, as substitutions were made in earlier comparisons.

A rank order of "1" corresponds to the largest amount of energy/money, the family member assigned a rank of "2" would receive less energy/money, and so on. If equal ranks are assigned to two or more family members, the rank orders they would have occupied if ranked separately are to be summed, and then divided by the number of family members to receive the same rank order position. For example, if three children are to share the highest rank, sum ranks of 1, 2, and 3 = 6 and divide by #children being ranked equally = 6 ÷ 3 = 2. Each child would then receive a rank of 2 and the next family member to be ranked would receive the rank of 4.

In addition to recording ranks assigned by the parent, indicate the position in which the target child was ranked, and the number of people included in the ranking.

For each of the ten areas listed in item 2, code whether the husband, wife, or both husband and wife are responsible for the financial decision. If the interviewer omitted the area, or the response is unclear, code "no answer."

Code item 3 according to whether the parent said <u>yes</u>, he/she can imagine a circumstance in which he/she would spend a lot of

money on the target child only, no, he/she cannot imagine such a circumstance, or the parent gave no answer.

ONLY ONE KIND OF CIRCUMSTANCE IN ORDER OF PRIORITIES IS TO BE CODED AS A RESPONSE TO THIS PROBE

The following list of possible types of circumstances the parent might indicate is presented in order from highest to lowest priority. If two or more types of circumstances are mentioned, code the one which appears highest on the list:

Presence of a special need: Parent would be willing to spend a lot of money on remedial education, sending child to special school, speech therapy, etc. in order to help the child overcome a special need, problem, long-term physical or emotional disability, or communication handicap.

Emergency/medical/dental: Parent would spend a lot of money on the target child if he/she were in an accident, required surgery, or had to have braces. In contrast to the long-term special needs in the first category, circumstances in this second category are of a more short-term nature, requiring only acute care or attention.

Presence of a special talent: If the child demonstrates special talent in a given area such as music, art, or sports, the parent would be willing to spend a great deal of money on lessons and training to cultivate this talent. However, spending money on piano lessons, art classes, etc. to give the child a well-rounded background is not to be coded in this category; circumstances such as these should be coded in the relative/situational category which follows.

Relative/situational: A large amount of money would be spent on the target child as particular age-related situations arose. These might include paying tuition, buying books, school supplies, and new shoes when school starts, sending the child to camp in the summer, paying for lessons and after-school activities, buying a bicycle when the child is old enough to ride it, or a stereo or car for the child during his/her teenage years.

Sex differences: Parent would spend a lot of money on target child because of his/her sex. For example, the parent might believe that it is important to provide a college education for a boy but not a girl, or that a girl should take ballet lessons in order to learn how to be graceful, but this would not be necessary for a boy.

Reward: If child did well in school, or helped out with chores around the house, parent would spend a lot of money on a reward for the child, such as a trip to Europe, a new bicycle, etc.

All kids eventually get the same: The money spent on the children averages out in the long run; one child may have a lot of money spent on him/her when he/she needs it, and then another child will have a turn later on. (Note that this is not really an answer to the question, as the kind of circumstance is not actually specified.)

No answer: Question was omitted by the interviewer or otherwise uncodable.

Sources of Beliefs

Administration

The parent is asked to fill out a questionnaire that deals with the extent to which various factors influence his/her child-rearing practices:

First, I want you to fill out this short questionnaire and then we'll talk about it.

The text of this questionnaire follows:

Interviewer _____

ID# _____

Date _____

How much do you think that each of the following things plays a part in how you are raising your child(ren)?

	None	A little	Some	A lot
How your parents raised you	____	____	____	____
In-laws or other relatives	____	____	____	____
Other parents' experiences and advice	____	____	____	____
Spouse's ideas	____	____	____	____
Differences between your children	____	____	____	____
Observations of other people's children	____	____	____	____
Teacher's advice	____	____	____	____
Professional advice other than teacher	____	____	____	____
Religion	____	____	____	____
Particular books or articles	____	____	____	____
Which ones? _____				
TV shows	____	____	____	____
Which ones? _____				
Other influences (please describe) _____				

At this point, the parent is asked to identify the factor which has had the greatest impact on the way he/she is raising his/her child(ren).

1. What do you think has influenced you the most in the way you raise your child(ren)? (You don't have to stick to this list.)

   (If necessary, ask: Which one of these is the most important influence?)

   (If necessary, ask: Can you think of anything that has affected the way you are raising your child(ren)?)

Due to the fact that ONLY ONE MAJOR INFLUENCE CAN BE CODED, it is up to the interviewer to probe responses which are combinations of influences. The interviewer might begin by acknowledging that both factors mentioned might influence the parent's childrearing practices a great deal, but then continue by asking the parent which factor has influenced him/her the most.

Responses indicating that the parent's own thoughts and ideas have been the major influence cannot be coded, and should therefore be probed. It is suggested that the interviewer acknowledge that the parent's own ideas influence the way he/she raises his or her child(ren), but then go on to explain that we are interested in factors which have influenced or affected these ideas.

Coding

Check only one major influence from among the following categories:

Own upbringing

Relatives

Other parents

Spouse

Own children

Other poeple's children

Teachers

Professionals

Religion

Educational books/articles/TV

(indicate) _____

Other books/articles/TV, not of a professional nature

(indicate) _____

Self-help groups

Other (indicate) _____

Combinations of influences, if not probed by the interviewer, should be coded in the "other" category, and each influence should be indicated in the space provided.

Preliminary Reliability Estimates

As of October 1, 1980, two coders have scored a total of 45 Family Influences on Childrearing Interviews. In accordance with our established procedures, interrater agreement is checked periodically during the coding process. As a result, these two coders have both scored four of the interviews, acting independently of one another. Interrater agreement ranged from 97% to 100%, with a mean level of agreement of 99.25%

DATE_____ CODER_____ ID#_____

II. DIFFERENCES/SIMILARITIES BETWEEN CHILDREN (Code only one)

A. Expectations before and after becoming a parent

☐ Same ☐ Different (Changed) ☐ Mixed ☐ No expectations before children ☐ No answer

B1. Expectations for first-born vs. second-born/target vs. older sibling

☐ Same (No) ☐ Different (Yes) ☐ Mixed ☐ No expectations ☐ No answer

2. Reasons for same/different expectations (Code only one in order of priority)

☐ Unique needs of one child (1)

☐ Individual differences in children (general) (2)

☐ Sex differences (3)

☐ Parent has changed (4)

☐ Parent has remained the same (5)

☐ All children basically alike (6)

☐ No expectations before had children (7)

☐ Other (indicate)_____(8)

☐ No answer (9)

3. Comparison

☐ Same

☐ Different

☐ Mixed

☐ No answer

4. Reason for diff./sim.

☐ Genetics

☐ Environment

☐ Both

☐ Other (indicate)_____

☐ No answer

5. Expectations of diffs./sims. when second-born or younger sibling was little

☐ Same ☐ Different ☐ Mixed ☐ No expectations ☐ No answer

DATE_____ CODER_____ ID#_____

III. CHANGES IN TIME SPENT WITH EACH CHILD

Amount of Time

More	Less	Same	N.A.	
☐	☐	☐	☐	Time with 1st-born since 2nd-born OR Older sibling since target
☐	☐	☐	☐	Time with 2nd-born vs. 1st-born OR Target vs. older sibling
☐	☐	☐	☐	Time with 2nd-born vs. 3rd-born OR Target vs. younger sibling

Rationales for Changes in Time: Less (Code as many as applicable)

1st- since 2nd-born OR Older sib. since target	2nd- vs. 1st-born OR Target vs. older sib.	2nd-vs. 3rd-born OR Target vs. younger sib.	
☐	☐	☐	More children
☐	☐	☐	Group time with both children
☐	☐	☐	More child-related duties
☐	☐	☐	Duties outside the home
☐	☐	☐	Needs of 2nd-born (OR target) greater than needs of 1st-born (OR older sib)--focus on age
☐	☐	☐	Needs of 1st-born (OR older sib) greater than needs of 2nd-born (OR target)--focus on age
☐	☐	☐	Needs of 3rd-born (OR younger sib) greater than needs of 2nd-born (OR target)--focus on age
☐	☐	☐	Parent ability to relate to child increases as child grows older
☐	☐	☐	1st-born (OR older sib) in school, plays with friends, etc. more than before
☐	☐	☐	2nd-born (OR target) in school, plays with friends, etc. more than 1st-born did
☐	☐	☐	2nd-born (OR target) in school, plays with friends, etc. more than before
☐	☐	☐	Unique needs of 2nd-born (OR target)--focus on individual differences
☐	☐	☐	Unique needs of 1st-born (OR older sib)--focus on individual differences
☐	☐	☐	Unique needs of 3rd-born (OR younger sib)--focus on individual differences
☐	☐	☐	Novelty of having children has worn off
☐	☐	☐	Not applicable/None of the above (indicate) _____

DATE_____ CODER_____ ID#_____

III. (Cont'd)

Rationales for Changes in Time(Cont'd): More (Code as many as applicable)

1st- since 2nd born OR Older sib. since target	2nd- vs. 1st-born OR Target vs. older sib.	2nd- vs. 3rd-born OR Target vs. younger sib.	
☐	☐	☐	Change in child-related duties
☐	☐	☐	Group time with both children
☐	☐	☐	Change in duties outside the home
☐	☐	☐	Needs of 1st-born (OR older sib) greater than needs of 2nd-born (OR target)--focus on age
☐	☐	☐	Needs of 2nd-born (OR target) greater than needs of 1st-born (OR older sib)--focus on age
☐	☐	☐	Needs of 2nd-born (OR target) greater than needs of 3rd-born (OR younger sib)--focus on age
☐	☐	☐	Parent ability to relate to child increases as child grows older
☐	☐	☐	1st-born (OR older sib) in school, plays with friends, etc. less than before
☐	☐	☐	2nd-born (OR target) in school, plays with friends, less than 1st-born (OR older sib) did
☐	☐	☐	2nd-born (OR target) in school, plays with friends, etc. less than before
☐	☐	☐	Unique needs of 1st-born (OR older sib)--focus on individual differences
☐	☐	☐	Unique needs of 2nd-born (OR target)--focus on individual differences
☐	☐	☐	None of the above (indicate)_____ _____, _____/Not applicable

DATE_____ CODER_____ ID#_____

IV. NEEDS (Code only one)

A. Target child's needs

1. Target child has special needs

☐ Yes ☐ No ☐ All children have special needs ☐ No answer

2. Type of major need

Positive	Negative	
☐	☐	Language
☐	☐	Personal/social (e.g., affective, emotional, attn.)
☐	☐	Cognitive (e.g., needs to be challenged in school)
☐	☐	Physical (e.g., allergies, physical strength)
☐	☐	Other (indicate)_____
	☐	No answer

3. Source of need

☐ Genetics
☐ Maturation (developmental lag/acceleration)
☐ Environment--other than family
☐ Environment--family
☐ Both genetics and environment
☐ Accident after birth
☐ Prenatal cause
☐ Illness of child
☐ Religion, fate, Karma, etc.
☐ Other (indicate)_____
☐ No answer

4. Permanence of need

☐ Permanent (hope won't outgrow) ☐ Nonpermanent (hope will outgrow) ☐ No answer

5. Change with special help

☐ Will change ☐ Won't change ☐ No change needed ☐ Change will occur without special help ☐ No answer

IV. (Cont'd)

B. Allocation of family resources (Code as many as applicable)

1. Money	5. Energy	
☐	☐	Yourself
☐	☐	Your spouse
☐	☐	First-born
☐	☐	Second- born
☐	☐	Third-born
☐	☐	Fourth-born
☐	☐	Other people, like parents
☐	☐	Target (same rank as in appropriate birth order box)
☐	☐	# of people ranked
☐	☐	No answer

2. Person responsible for major financial decision (Code all)

husband	Wife	Both	No answer	
☐	☐	☐	☐	Clothing for family
☐	☐	☐	☐	Purchase of a car
☐	☐	☐	☐	Entertainment/recreation
☐	☐	☐	☐	Responsibility for budget making
☐	☐	☐	☐	Household furnishings
☐	☐	☐	☐	Vacations
☐	☐	☐	☐	Food
☐	☐	☐	☐	Household maintenance and repair
☐	☐	☐	☐	Special activities for children
☐	☐	☐	☐	Putting money in savings

3. Special circumstance

☐	☐	☐
Yes	No	No answer

4. Kind of circumstance (Code in order of priorities)

☐ 1) Presence of a special need (e.g., long-term physical or emotional disability, remedial education or special school)

☐ 2) Emergency/medical/dental

☐ 3) Presence of a special talent (only if mentioned as a talent)

☐ 4) Relative/situational (developmental--babies, teens need more things; school time--tuition, books, shoes; also, summer camp, hockey lessons)

☐ 5) Sex differences (boys need a college education, girls need ballet lessons to learn to be graceful)

☐ 6) Reward (trip to Europe for good grades)

☐ 7) All kids eventually get the same

☐ 8) No answer

DATE_____ CODER_____ ID#_____

V. SOURCES OF BELIEFS (BEH only) (Code only one)

Major influence

- ☐ Own upbringing
- ☐ Relatives
- ☐ Other parents
- ☐ Spouse
- ☐ Own children
- ☐ Other people's children
- ☐ Teachers
- ☐ Professionals
- ☐ Religion
- ☐ Educational books/articles/TV

  (indicate)_____
- ☐ Other books/articles/TV, not of a professional nature

  (indicate)_____
- ☐ Self-help groups
- ☐ Other (indicate)_____

PARENT-CHILD INTERACTION

OBSERVATION SCHEDULE (PCI)*

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Princeton, New Jersey 08541

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*Adapted with permission from Sigel, Rosner, Flaugher, Livak, Teacher Observation Instrument, ETS, 1976. The authors gratefully acknowledge James E. Johnson and Alexi Schauer for their contribution to the 1977 edition and the helpful comments of Ann McGillicuddy-DeLisi for this revision.

PARENT OBSERVATION INSTRUMENT

This instrument has been developed as part of a program investigating representational thinking in young children. Representation, an intrinsically inherent human capacity, involves the ability to mentally reproduce the past, anticipate the future, and assess alternatives in the present, transcending immediate spatial and temporal perceptions. This schedule is a listing of categories of parent behaviors which activate representational thinking (i.e., mental operational demands on the child to distance). We refer to these strategies as "distancing" strategies because they serve as a means to create psychological distance between the child and his immediate physical and temporal environment.

The instrument was originally developed and used to evaluate teacher-child interactions at ETS from 1975 to 1977. The mean interrater agreement across 14 twenty-four minute observations was 82%. The range of agreement for each of 14 observations was from 71% to 95%. The revised instrument was used to evaluate 480 videotaped parent-child interactions at ETS from 1976 to 1978. The range of agreement between pairs of coders for mental operational demands was from 72% to 99% for 20% of the observations, with a mean interrater agreement of 86.5%.

Manual for Coding Parent-Child Interaction Videotapes

Contents

I. Parent Behaviors

A. Codeable Unit from Parent Utterance

1. Summary Definition of Entries

2. Copy of Coding Forms

B. Communication Cohesion

C. Form

D. Verbal Emotional Support System

E. Nonverbal Parent Behaviors

1. Emotional Support System

2. Task Facilitation

F. Rating of Parent's Warmth

G. Rating of Parent's Sensitivity

H. Parent Verbal Teaching and/or Management

1. Teaching, Mental Operational Demands

2. Structuring Task and Task Supportive Behavior

3. Child Management

II. Child Behaviors

A. Rating of Engagement

B. Rating of Child Performance on Task

III. Identification of Interaction Participants, Unit, Time, Reading

IV. Categories of Mental Operational Demands, Task Management and Child Management

I. PARENT BEHAVIORS

A. Codeable Unit from Parent Utterance

Every utterance from the parent that occurs in the initial two minutes, final two minutes and one minute at the midpoint of the interaction will be coded. Selection of units in coding was based on means and ranges obtained in prior studies (cf. Sigel, McGillicuddy-DeLisi, & Johnson, Note 1) while meeting requirements to assess how the parent introduces, carries out and concludes the interaction. Emphasis is on verbalizations although nonverbal behaviors will be coded, behaviors such as emotional physical contact, helping and take-over (see section on Nonverbal Parent Behaviors). Exact repeats will be coded as one unit, e.g., "That's right, that's right."

A complex sentence with two separate demands will be separated by demand. Each demand will be coded in a separate box with a child response coded in conjunction with each demand or no time (NT) if responses required can't be combined (such as "looking" and some other response).

Example: "Look at #2, and tell me what we should do."

code Low MOD + child response in block 1
code High MOD + child response in block 2

When the demands are redundant in a complex sentence or question, i.e., the same Mental Operational Demand (see Section IV, Categories of Mental Operational Demands, Task Management and Child Management for definitions) appears in both parts, code the demands in only one box.

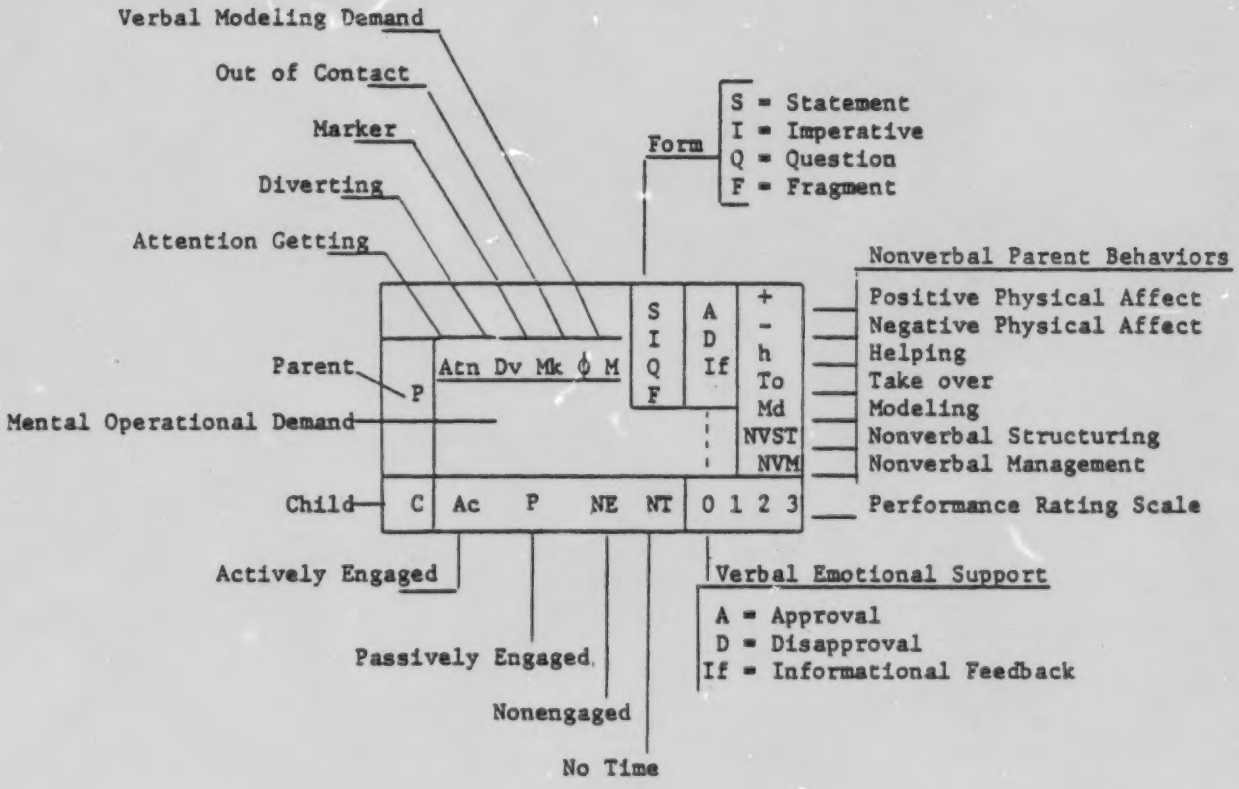
Example: "Hand me a piece of paper and take one for yourself."

code both as structuring + child response in one box

"This is a nice book. Don't you think so?"

code both as High MOD + child response in one box

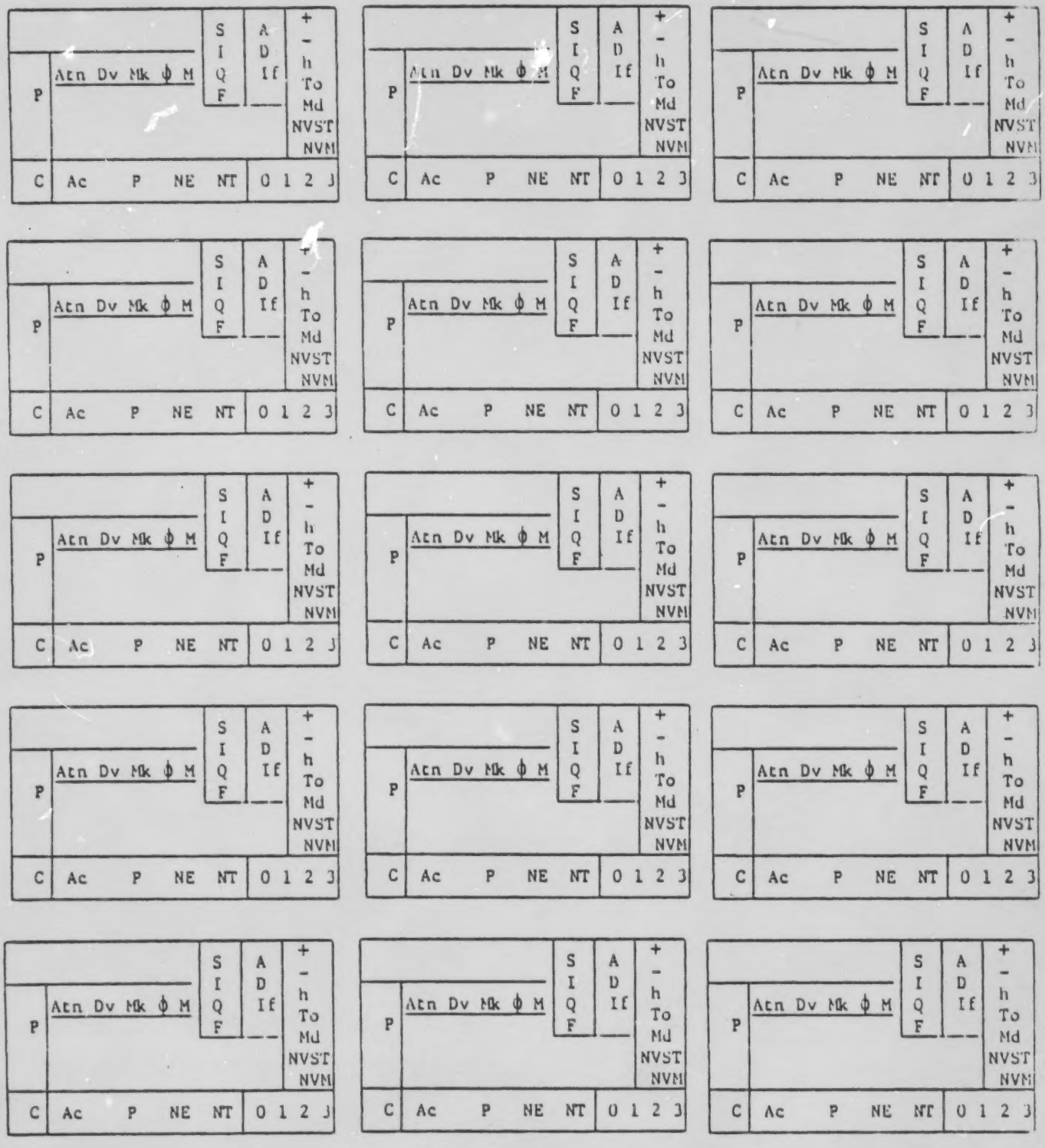
SUMMARY DEFINITION OF ENTRIES



Parent-Child Interaction Analysis

Coder_____ Taper_____ Task_____ Order_____ ID No._____

Date Coded_____ Total Time_____ Date Taped_____ Session_____



Parent-Child Interaction Analysis

Coder_____ Taper_____ Task_____ Order_____ ID No._____

Date Coded_____ Total Time_____ Date Taped_____ Session_____

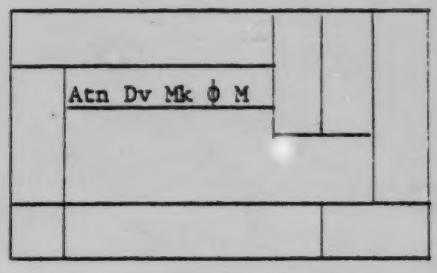
Beginning Time_____ Ending Time_____

Warmth Rating 0 1 2 3

Sensitivity Rating 0 1 2 3

B. Communication Cohesion

This is coded in addition to the Mental Operational Demand (MOD), Form, the Emotional Support, and Task or Child Management.



Attention Getting (Atn)--Parent behaviors used to get or hold child's attention. Definitions and examples follow.

Orienting - Verbalizations that are always fragments, used to get or hold child's attention and move the task along. These contain no hint of affect or approval.

Example: "Okay" "All right"

There are times when "Okay" and "all right" are used as orienters or as a means to move the task along and have no approval quality, but there are other times when they are used for approval. The coder has to make the decision based upon what's going on at the time.

When orienting is coded, do not code approval.

Examples: "Okay, let's get started."

(Atn) + (St) (no approval)

"All right, this is going to be fun."

(Atn) + (High MOD)

When words such as "Okay" and "All right," are used as approval, they may appear alone following successful completion of a demand, in which case code as approval only, OR they may appear with the next step indicating approval of the past step.

Example: "Okay, what's next?" (approving last step and moving task along)

(app) + (Medium MOD)

If the "Okay" or "All right" followed an approval which indicated the completion of the last step, it would be considered orienting.

Example: "That's good."

(app - coded alone)

"Okay, what's next?"

(Atn) + (Medium MOD) (code in next block)

Redirecting - Bringing back to task: child is off task and parent directs focus back to task or parent has been off task and redirects focus back to task.

Example: Either of the above can follow NE, coded for child in the previous unit block. Also, code above for Mental Operational Demand when relevant, or Emotional Support.

Parent redirects to task: Atn/MOD, etc.

Diverting (DV)--Off task: Parent changes focus to something off task, or child is off task and parent focuses on something else that is also off task rather than redirecting.

Examples: Parent initiates a diversion: Dv/MOD, etc.

Parent maintains a diversion initiated by child: Dv/MOD, etc.

Marker(Mk)--A question asked merely for effect with no answer expected. It must be followed by No Time (NT). If time is allowed for a response, then the question is coded for the appropriate MOD according to content of the utterance. The form of the marker is not coded.

Examples: "This is a book. Huh?"

code Low MOD + S + Mk

"We're going to make a plane. Okay?"

code St + S + Mk

"Fold it together. You know?"

code St + I + Mk

Out of Contact (ϕ)--Parent may either be on or off task but is not responding to the child. For example, the parent may get totally involved in folding own object or daydreaming or talking to self, in which case there would be no demand made on the child.

Verbal Modeling (M)--Telling child what to do while the parent is involved in showing or demonstrating. Parent's model must be visible and demand must be for one step only. The content is coded separately, such as structuring or an MOD. If verbal modeling is coded, do not code nonverbal modeling (see Section on Nonverbal Parent Behaviors).

Examples: "It would work better if you fold yours the way I'm folding mine."

(Med MOD) + (M)

"Fold it this way."

(St) + (M)

"Turn it the way I have mine turned."

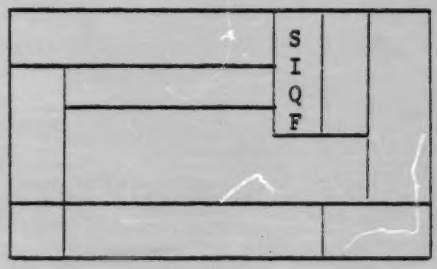
(Med MOD) + (M)

"Push right here."

(St) + (M)

C. Form

This is coded for Mental Operational Demands, Task or Child Management, and the Emotional Support System



Statement (S)--A declarative sentence, telling, giving information. Coded for demand on child, including the demand to attend and to understand the mental operation performed by the parent, although the engagement of the child may be quite passive.

Example: "I'm going to make one first."

Imperative (I)--A command; giving directions for a behavior.

Examples: "Fold it this way."

"Stop that!"

"You be still."

Question (Q)--Any question with mental operational demand quality; no differentiation is made between an open or closed question in coding, although definitions and examples of each follow. A question can reflect convergent thinking; it may require one word answers or imitative statements (What did I say?); closed questions involve recall, or simple yes, no answers.

Examples: Parent asks: "What did I just say?"

"What is the name of the book you read in school?"

"What three ways can you fold the paper?"

"Do you want to turn the page?"

A question can also be an open question with "demand" quality or elaborated, divergent qualities where the question requires reconstruction and where the child has a choice in how the answer is given.

Examples: Parent asks: "What ways can the paper be folded?"

"What kind of boats do you like?"

"What did you do in school today?"

"What did you like about the story?"

Fragment (F)--Incomplete sentence or question. If a fragment stands alone, or makes a demand different from the following utterance, code for Mental Operational Demand. Do not code false starts, code what follows next. If a fragment is not approval and fits with what comes next with no child response in between, incorporate into what comes next.

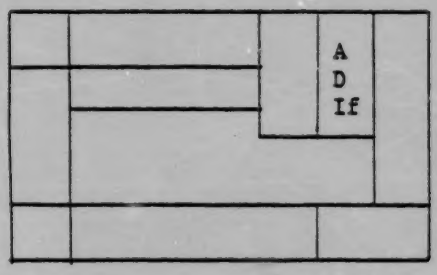
Examples: "Fold ... That's right!"

(F)

"Fold - No, wait!" (no hesitation after fold)

(ignore) (disapp) + (st)

D. Verbal Emotional Support System



These are parental verbalizations which convey affection and/or support for the child. These behaviors do not make cognitive demands, but rather they serve to encourage and/or guide the child's efforts in dealing with the task. The parent seems to be responding to the child's previous performance as well as providing emotional support for subsequent performance. When units are coded as "emotional support," mental operational demands are included only for those accompanying questions or imperatives.

Approval (A)--Positive verbal feedback. Definitions and examples of different types of approval follow.

Approval without Task Facilitation - Positive verbal feedback without additional task specific information.

Examples: "That's very good."
"That's great!"
"Isn't that great?" (Not waiting for response)
"I really like that."
"Right."
"Very good."
"Okay."

Approval with Task Facilitation - Positive verbal feedback with additional task facilitation, such as moving the task forward.

Examples: "Yes, now fold it this way."

(app) + (St)

"Right, now what do we do?"

(app) + (High MOD)

"Okay, now look at No. 2."

(app) + (Low MOD)

Approval, qualified - Positive verbal feedback with some additional suggestion, usually task specific.

Examples: "That's very good but press it down a little more."

(app) + (St)

"Okay, but it would fly better this way."

(app) + (Med MOD)

"Yes, but this fold might be neater."

(app) + (Med MOD)

Reflection - Parent in response to the child, captures the child's meaning or mood reaffirming it in statement form; can be essentially the same words, adding no information so that the meaning of the child's statement is not changed. Direct or implied questions are not reflections even though the meaning is similar. There is no explicit or implicit demand in a reflection.

Examples: Child: "I want to go over to my friend's house."

Parent: "You do not want to stay here."

Child: "That's a sailboat."

Parent: "That is a sailboat."

Child: "That's hard, I can't do it."

Parent: "You feel that's too hard for you."

DO NOT CODE THESE AS REFLECTIONS:

Child: "That's a boat."

Parent: "That's a sailboat."
("sail" adds additional information so code the Mental Operational Demand/Statement)

Child: "That's just like the picture."

Parent: "That's just like the picture?"
(The question form puts a demand on the child to respond so code the Mental Operational Demand/Question)

Disapproval (D)--Negative verbal feedback. Definitions and examples of different types of disapproval follow.

Disapproval without Task Facilitation - Negative verbal feedback without additional task specific information.

Examples: "That's wrong."

"No, not like that."

"It'll never fly!" (with disapproval tone of voice)

Disapproval with Task Facilitation - Negative verbal feedback with additional task facilitation

Examples: "No, look at No. 3."

(disapp) + (Low MOD)

"No, what should we do?"

(disapp) + (High MOD)

Disapproval, qualified - Negative feedback combined with a more positive comment or suggestion, usually task specific.

Examples: "That's wrong, but maybe it will work."

(disapp) + (High MOD)

"That's a messy fold, but this one looks okay."

(disapp) + (High MOD)

"Not that way, but we can fix it."

(disapp) + (High MOD)

"No, but turning it around would work."

(disapp) + (High MOD)

Correction - Feedback when a mistake has been made but no overt approval or disapproval; includes task specific information.

Examples: "It would work better if you folded it over here."

(disapp) + (Med MOD)

"If that were pressed down harder, it would be easier."

(disapp) + (Med MOD)

"If the points touch, this fold will come out better."

(disapp) + (Med MOD)

Corrections could also be interpreted as structuring. Give coding priority to correction if clearly in response to an error by child.

Informational Feedback (If)--Parent responds to the child's inquiry by providing information. There are two categories here.

A simple, directly relevant and nonelaborated response.

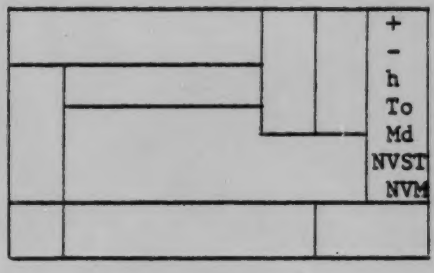
Examples: Child asks if plane is ready to fly and Parent responds: "Not yet."

Child asks "What is this called and Parent responds: "A sailboat."

An elaborated response which expands the information into more than one statement; may go on for several statements. Mental Operational Demands will not be coded as long as the parent is responding to the child's inquiry in statement form.

Example: Child asks how a sailboat works and Parent responds: "The air gets caught in the sail of the boat and pushes it along. Also, there is a rudder which you move to steer the boat."

E. Nonverbal Parent Behaviors



These are coded in addition to Mental Operational Demand, the Verbal Emotional Support or alone, however the behavior occurs. More than one can be coded at the same time.

1. Nonverbal Emotional Support

Positive Physical Affect (+)--Obvious physical demonstration of affection.

Examples: hugging alone = +

hugging plus "You're great at this!"

(+) and (App)

Negative Physical Affect (-)--Obvious physical punishment or show of disapproval or hostility.

Examples: Spanking = -

Shoving into chair plus "You sit there!"

(-) and (High Power)

2. Nonverbal Task Facilitation

Helping (h)--Parent intervenes or assists physically with task, both parent and child are touching the object.

Takeover (To)--Parent intrudes and does task while child is idle; child's hand is not on the object and parent does it for him.

Nonverbal Modeling Demand (Md)--Nonverbally directing child to copy parent's behavior, such as by pointing, nudging, head movement, sounds, etc. If verbal modeling occurs, do not code nonverbal modeling (see section on Communication Cohesion).

Nonverbal Structuring (NVST)--Refers to management of the task or facilitation of task; physical structuring of the distance between parent or task and child to focus or maintain child's attention without positive or negative overtones, such as tapping child's shoulder to get attention, physically moving (without force) the child in the direction the parent prefers, actual holding in lap or holding in chair to focus attention without the child trying to get away, moving materials to facilitate task or removing distractions, holding pages down to prevent page turning.

Nonverbal Management (NVM)--Refers to management of child's behavior; an attempt by the parent to change or stop the child's behavior; physically preventing the child from an action or physically forcing the child into a position or an action, such as stopping the child from throwing, forcing the child into the chair or holding the child in lap while s/he is struggling to get away.

F. Rating of Parent's Warmth

An evaluation by the coder of the warmth exhibited by the parent during the task. This is a general rating based upon the coder's

impression. Actions expressing enthusiasm, playfulness, enjoyment of the child or of doing something with the child, understanding, compassion, etc., would contribute to the rating. These may be evident through tone of voice, smiles or other facial expressions and head movement such as nodding.

Rating Scale:

0 = Very little or no warmth

1 = Some warmth exhibited but not a lot of the time

2 = Warmth exhibited more often and more intensely

3 = Much warmth exhibited often

G. Rating of the Parent's Sensitivity to the Child

This is a global rating combining the parent's sensitivity to the child's cognitive level, to the child's emotional state, and to the child's physical state. It is essentially a measure of how well the parent is "tuned in" to the child. This is not a rating of whether or not the coder likes that parent or feels that parent is warm, but one in which an attempt is made to objectively rate the sensitivity of the parent to the child. The questions which follow will help determine the rating:

Is the construction of sentences or questions too complex or too simple?

Is the parent bombarding the child with verbalizations, i.e., questions, statements, or imperatives?

Is the parent working with the child's attention span or against it?

Does the parent seem to know how to get the child to do the tasks or to cooperate? (This is not related to the successfulness of the child response, i.e., how well s/he does the task.)

Is the parent accepting of the child's product which may or may not be perfect, or more concerned with perfection so that corrections are numerous?

Does the parent seem aware of when the child can function alone or when the child needs help?

Rating Scale:

0 = Very little or no sensitivity

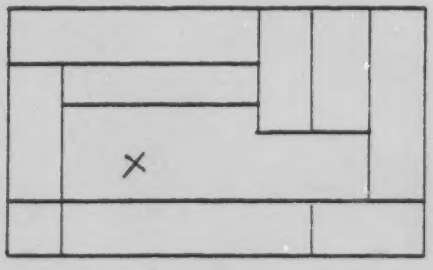
1 = Some sensitivity exhibited but not often or not over all areas

2 = Sensitivity exhibited more often and over more areas

3 = Much sensitivity exhibited most of the time and over most areas

H. Parent Verbal Teaching and/or Management

This includes Mental Operational Demands, Task Management and Child Management

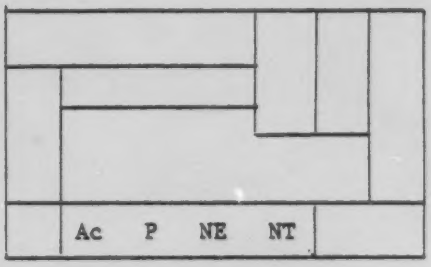


Mental Operational Demands (MOD)--Demands on the child to think representationally. See Section IV for definitions.

Task Management--Preparation and maintenance of the task. All examples are to be coded as Structuring (St). See Section IV for definitions.

Child Management--Coded if child is doing something the parent doesn't like, the behavior is considered wrong by the parent--a misbehavior rather than an error on the task--and the parent attempts to stop or change the behavior. Parental efforts at modifying child's nonintellective behavior in the social or emotional domain. See Section IV for definitions.

II. CHILD RESPONSES



The child response is important in terms of measuring parent involvement with the child, with success indicated by engagement of child. If the child remains nonengaged for some period of time without the parent redirecting or diverting to join child or using some form of child management, the parent is indicating a lack of involvement with the child. We are not specifically coding the child as initiator, though the parent as responder (see Emotional Support System) will indicate when the child is in control. Child response will be coded for every parent entry, Mental Operational Demands, Emotional Support, and Nonverbal Parent Behaviors.

A. Coding the Child's Engagement

Actively Engaged (Ac)--The child gives an active, relevant response, the correctness is not important.

Passively Engaged (P)--The child is attending (listening) but there is no visible physical or verbal response other than eye fixation and orientation.

Nonengaged (NE)--Definitions and examples of different types of non-engaged behaviors follow.

The child is involved in an irrelevant response or another activity entirely, with active involvement.

Example: Playing with the phone instead of folding. Code NE.

The child is neither attending nor exhibiting any overt non-task behavior; could be nonresponse to a question or imperative or looking away when parent is demonstrating, reading, etc. Primarily, picked up by child looking away.

Example: If the parent diverts and child joins in:
"We're going to the zoo later" (Parent).
"Great!" (Child). Code Ac
(Child just listening) Code P
If parent diverts and child ignores (continues with task) or diverts to another topic, code NE.

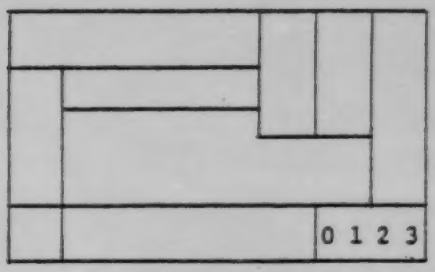
No Time to Respond (NT)--Parent does not allow time for a child response: when the parent is "bombarding" the child with a series of questions and/or fragments, there is no time for a child response because of incompatible parent follow-up. Code all but the last unit in a series with NT. The last question in a series will not have NT coded, indicating time has been allowed for the child response. After a parent statement followed directly by another utterance, there is no demand except to listen, so code Passively Engaged if child is listening but do not code NT. After a parent imperative requiring a child response, motoric or verbal, and no time is given, code NT. After a parent question followed directly by another utterance, code NT. When NT is coded, no other child response is coded.

Examples: "Should I fold it this way? What should I do next?"
(no hesitation - code NT with the first question and appropriate child response with the second question)

"Fold it this way. Wait! This isn't straight."
(no hesitation - code NT with the first order and appropriate child response with the second order and the statement)

"This is blue. It's light blue."
(no hesitation - do not code NT, code Passively Engaged if child is listening)

B. Rating Child's Performance



An evaluation by the coder of the child's performance at the completion of each step according to the following rating scale. This is only coded for the paper folding task. For the younger child this will involve six steps, for the older child, there will be nine steps. The time unit should also be coded. Since the performance is rated only upon completion of a step, there will be blocks with nothing coded. There may be steps which are never completed. This should be noted when it occurs. If more than one step is completed in the first two minutes, rate each and note which step. If only one step is being worked on, rate the completion of it and note which step, even if it continues past the first two minutes. Repeat the same procedure for the last two minutes. If possible, repeat also for the middle minute. This procedure will yield at least three child ratings if the child and parents are involved in the task. If the child and parent are <u>not</u> involved in the task or are involved for only one portion of the task, note the problem and rate whatever is there. The coder may have to go beyond the first two minutes to get one rating, and/or may have to back up prior to the last two minutes. Either case may be true to get a rating for the middle minute. It is not important which steps are rated as long as the step number is noted.

Rating Scale:

0 = Total failure to complete the step by child

1 = Step completed with much help and/or child mistakes

2 = Step completed with some physical assistance

3 = Step completed correctly with almost no physical assistance (verbal assistance allowed), and with few mistakes

III. IDENTIFICATION OF INTERACTION PARTICIPANTS, UNIT, TIME, READING

Family ID number preceded by MT = mother - target child

MS = mother - older or younger sibling

FT = father - target child

FS = father - older or younger sibling

This should be recorded on each coded sheet, as well as the page number of that code sheet.

Each second of time passed since the beginning of tape will be displayed on the screen.

Record time in upper left corner of unit box, in first unit on each page and in first unit of third and fifth line. Also note time when coder has a question. Key words can also be noted, or the total utterance.

During story, record beginning and ending time of each unit of continued reading in one box, whether reading is by child or parent. Reading will assume to be by parent so note if by child. Record the word "Reads" in box where MOD would be coded. If parent is paraphrasing story instead of reading, code "Low MOD-para" and record beginning and ending time of the paraphrasing just as for reading.

IV. MENTAL OPERATIONAL DEMANDS (MOD) ON THE CHILD THROUGH PARENT DISTANCING STRATEGIES

Three main groupings will be used based upon the level of the distancing demand upon the child:

Level 1 - Low Distancing

label
produce information
describe, define
describe - interpretation
demonstrate
observe

Level 2 - Medium Distancing

sequence
reproduce*
describe similarities
describe differences
infer similarities
infer differences
symmetrical classifying
estimating
assymmetrical classifying
enumerating
synthesizing within classifying

Level 3 - High Distancing

evaluate consequence
evaluate competence
evaluate affect
evaluate effort and/or performance
evaluate necessary and/or sufficient
infer cause-effect
infer affect
infer effect
generalize
transform
plan
confirmation of a plan
conclude
propose alternatives
resolve conflict

*reproduce/_____(another MOD) - These will be grouped according to the MOD, ignoring the reproduction aspect. Example: reproduce/lab = Low MOD; reproduce/plan = High MOD.

Definitions and Examples of Mental Operational Demands on the Child through Parent Distancing Strategies

The demand on the child is to . . .

Observe (obs)

Definition: Getting the child to attend using any senses: hearing, seeing, smelling; asking the child to examine, e.g., parent demonstrating which demands that the child observe.

Examples:
"Look at the book."
"Do you see No. 1?"
"Watch - this is how you fold it."
"Look what happens when I fold it this way."
"Go look at No. 2."
"Do you see how the airplane will look when we're through?"

Comment: The form of the demand is in a verbal context, and the parent's action is a demonstration, BUT the child to comply must observe, hence parent demand behavior coded as observe. Must be distinguished from structuring (see structuring/explanation and structuring/demonstration).

Label (lab)

Definition: Naming a singular object or event or action; naming a place, appropriate designation of something, locating; identify, a single discrimination; NO ELABORATION; ownership, possessives. Labelling is discrete and does not involve inference.

Examples:
"Do you know the name of this book?"
"Do you know the name of what we're going to make?"
"Where is the rock in this picture?"
"Do you know the name of this?"
"What is the color?"
"What do you have on your feet?"
"What do you call what she is doing?"
"Where is the book?"
"Whose book is this?"

Comment: To be distinguished from concept or class labelling which is symmetrical classifying (see symmetrical classifying).

(a) Produce Information (prod)

Definition: Produce, process, confirm or reject information about labelling, location, materials, events; associational information. Requires a yes - no answer from child.

Examples: "Is this called a boat?"
"Is this a rainbow?"

Comment: Only questions appear here, no parent telling.

Describe (des)

Definition: Providing elaborated information of a single instance, e.g., appears, looks. A statement may be definitional. Actions or inner states of self such as feelings, fantasies, ideas, are classes of parent verbalizations coded in this category.

Examples: "There are many flowers hiding the rainbow."
"What is the boy doing?"
"What is a rainbow?"
"What is make-believe?"
"The boy is pretending the rock is all these different things."

Comment: Static: no dynamic relationships among elements, no use, no functional context.

(a) Interpretation (intp)

Definition: To attribute or to explain meaning; more personal than a definition.

Examples: "What do you mean?"
"What does it mean to make believe?"

Demonstrate (dem)

Definition: Showing primarily through action or gestures how something is to be done; the how process.

Examples: "Show me how to fly it?"
"Let me see you make the airplane."

Comment: If the parent does the demonstrating, the demand on the child is to observe (see comment under observe).

Sequence (seq)

Definition: Temporal ordering of events, as in a story or carrying out a task; steps articulated. Types of key words are last, next, afterwards, start, and begin.

Examples: "First we'll do #1, then we'll do #2."
"What do we do next?"
"Is #4 next?"
"What did the boy pretend first?"

Comment: Not to be confused with structuring, as in "Paul, it's your turn."

Reproduce (rep)

Definition: Reconstructing previous experiences; dynamic interaction of events, interdependence, functional; open-ended; child's organization of previous experience.

Examples: "Tell me how you made this with Daddy."
"How did you paint a rock in nursery school?"
"What did you do when you flew on a plane?"

(a) Reproduce/____ (repro/other categories)

Definition: A closed reconstruction where any clue is given, convergent, in combination with any of the other categories.

Examples: repro/lab - "Name the three steps we just did."
repro/seq - "What step came after number one?"
repro/esti - "How many steps did it take to make the boat?"

Propose Alternatives (pro alt)	Definition:	Different options, different ways of performing the task; no negative aspect. Possible key words are other, another, different from before.
	Examples:	"What other way could we fold this?" "Do you know another way to make a boat?"
	Comment:	Not additive as in "What else do we need to add?" or "Can you tell me something else?" No articulation of judgment as in a "better way to do it."
Resolve Conflict (res con)	Definition:	Presentation of contradictory or conflictful information with a resolution; problem solving; negative condition exists with focus on an alternative solution - one situation which is an impossibility needs to be resolved in another way; does include inferences of cause-effect relationships but includes an additional element of identifying the central element in one situation that can be transferred to another situation.
	Examples:	"If there were no paper, how could we make an airplane?" "If there is no light in here, how could we see to read?"
Compare	Definition:	Describing or inferring characteristics or properties across classes, not within - two separate instances being compared; noting the existence of a similarity or difference, describing or inferring only how alike or different
	Comment:	No explicit statement of what characteristic is common to both is coded here, since that is symmetrical classification.

(a) Describe Similarities (des sim)

Definition: Noting ostensive common characteristics. Perceptual analysis - comparison of sensory materials present in the interaction, e.g., objects, rhymes, pictures, etc.

Examples: "Is your boat like mine?"
"Your shirt has the same colors as the rainbow."

(b) Describe Differences (des dif)

Definition: Noting ostensive differences among instances. Perceptual analysis - comparison of sensory materials present in the interaction, e.g., objects, rhymes, pictures, etc.

Examples: "Is your plane different from mine?"
"Which plane looks different from #6, yours or mine?"

(c) Infer Similarities (inf sim)

Definition: Identifying nonobservational commonalities. Conceptual analysis - instances not present for sensory comparison (see comment below); analogies, part-whole relationships.

Examples: "This looks more like a hat than a boat."
"Does it look like a mirror to you?"
"Fold yours the same way."

(d) Infer Differences (inf dif)

Definition: Identifying nonobservable differences. Conceptual analysis - instances not present for sensory comparison (see comment below).

Examples: "Does your plane look different from a real plane?"
"How does this rock differ from the last one?"

Comment: Inference refers to literal nonpresence of all or part of the materials. In inferring "Are a dog and a tiger alike," neither instance may be present which requires an inference about both of them; or one of them may be there, e.g., as a toy, picture, or live, which still requires an inference although only about one of them.

Combine — Definition: Stating the reason for combining.

(a) Symmetrical Classifying (sym class) — Definition: Identifying the commonalities of a class of equivalent instances or labeling the class; stating why instances are alike, not how.

Examples: equivalence - "Why is yours like mine?"
"Why is this plane like a real plane?"
class label - "What do you call red, yellow, blue, and green?"
"What do you sail on the lake in, or canoe in?"

(1) Estimating (esti) — Definition: Estimating quantity.

Examples: "How often do you see rainbows?"
"How many things can you do with a box?"
"How many steps are on the board?"

(b) Asymmetrical Classifying (asym class) — Definition: Organizing instances within the same class in some sequential ordering; logical hierarchy; viewing the relationship as a continuum; seriation of any kind; comparative where each instance is related to the previous one and the subsequent one; relative (bigger to smaller, more or less).

Examples: "Is your boat better than mine?"
"Does your plane fly better than mine?"
"Which boat looks most like the one on the board, yours or mine?"

(1) Enumerating (enum) — Definition: Seriation, enumeration of number of things; ordinal counting (1,2,3,4,5).

Examples: "Count the steps on the board."
"Count the steps we've finished."
"Count the rocks in the book."

(c) Synthesizing (syn)

Definition: Organizing components into a unified whole; explicit pulling together; creating new forms; sum of a number of discrete things.

Examples: "When you add "rain" to "bow," what word does that make?"
"Do we have a fleet of sailboats?"
"How many things do you know that can fly?"

Evaluate

Definition: Assessing the quality of any givens.

(a) Consequence (eval con)

Definition: Assessing the quality of a product, or outcome, or feasibility, or the aesthetic quality of personal liking. Criteria needed for evaluation, e.g., good - bad, right - wrong, fun - not fun, silly - not silly. Evaluation of parent's interpretation of what the child means.

Examples: "If rainbows are real, can you play with them?"
"Can we build a castle with sand?"
"Could we paint a rock and use it for a paperweight?"
"Is this a good airplane?"
"This is hard to make."
"Do you like this book?"

Comment: Conditional competencies or qualified "can you" questions are included under this category.

(b) Own Competence (evalcomp)

Definition: Assessing own competence or ability.

Examples: "Can you fold it like this?"
"Do you know how to make a boat?"
"I can make a boat with paper."
"I can't do it."

Comment: Includes those statements that use the word <u>can</u> literally, e.g., physical and/or social feasibility; also must contain a personal reference (not a collective "you" or "we").

(c) Affect (eval aff)

Definition: Assessing the quality of a feeling state.

Examples: "Is it fun to feel happy?"
"Do you like to feel sad?"
"How do you feel about feeling sad?"

(d) Effort and/or Performance (eval perf)

Definition: Assessing the quality of the performance and/or the effort expended on a task (ignore confirming, e.g., "That's neat."; "That's good.")

Examples: "Did you work hard at that?"
"You did that well."
"Did you do that efficiently?"
"Are your working hard or are you playing?"

(e) Necessary and/or Sufficient (eval nec)

Definition: Assessing information that is necessary or sufficient for something to happen; reality confirmation; recognition of absurdities.

Examples: "Can the boy really catch the rainbow?"
"Can you have a rainbow when there is no sun?"
"Do you have to have a rock to hold the paper?"

Infer

Definition: Focusing on nonapparent, unseen properties or relationships

(a) Cause-Effect (inf c-e)

Definition: Predicting outcome on the basis of causal relationships of instances or statement thereof; explanation or reason for some event, direct or indirect.

Examples:
(cause) (effect)
"How could you make it fit in that hole?

(effect) (cause)
"We can make a boat by folding this paper?"

(cause) (effect)
"How can you keep the wind from blowing paper away?"

(effect) (cause)
"Will the airplane fly when you throw it?"

(cause) (effect)
"If we fold it like that, what will we make?"

(b) Affect/Feelings (inf A)

Definition: Predicting or assessing how a person feels, or believes, or intends.

Examples: "Was the boy feeling sad?
"Did Pat mean to tear up the box?"

Comment: Not a description of affective behavior.

(c) Effects (inf E)

Definition: Predicting what will happen without articulating causality; effects of a cause; prediction of someone else's competence, or feasibility, or location.

Examples: "Did he find it?"
"Where will the rainbow hide?"
"Will Pat tear up this box?"
"Will the string work all those things?"

Generalize (gen)

Definition: Application or transfer of knowledge to other settings or objects; a new situation going beyond the immediate task or context.

Examples: "This is my own shirt and that is your own shirt and that is a rainbow of his own."
"Now that we know rainbows and rain water go together, do you think the fish bowl water can make a rainbow?"

Transform (tran)

Definition: Changing the nature, function, appearance of instances; focusing on the process of change of state of materials, persons, or events. Inferring is a part of this - the prediction of what will happen relating to a change of state.

Examples: "What do you need to do to a rock to change it into sand?"
"What will the rock turn into if you smash it?"
"What will Catarina become when she lives in the castle?"

Plan (pl)

Definition: Arranging of conditions to carry out a set of actions in an orderly way; acting out a rule of the task or actual carrying out the task. The child is involved in the decision.

Examples: "What do you want to do?"
"Do you want to read to me?"
"Do you have to open it up before doing the next fold?"
"How can we make a plane with this paper?"
"If you want the fold here, what should you do?"

Comment: If cause-effect is indicated, materials must be present. Most often appears in the form of questions; but indirect questions and imperatives seeking information may also appear.

(a) Confirmation of a Plan (pl C)

Definition: Checking whether the plan was carried out.

Examples: "Does it look the way you expected it to?"
"Did it turn out the way you wanted?"

Conclude (concl)

Definition: Relating actions, objects or events in an additive and/or integrative way; summarizing, reviewing. This category is used for the last parent statement or question in a series of questions leading up to a conclusion. Key words are so, therefore.

Examples: "Are you finished?"
"Looks like it's wet so must've rained, huh?"
"Who's winning the race?"
"If the rock becomes sand, could it be used as a paperweight?"

Comment: The child has to go through more than one cognitive step to arrive at an answer.

MANAGEMENT OF TASK AND MANAGEMENT OF CHILD'S BEHAVIOR

Task is defined as:

content, cognitive demand, activity demands of the task, materials of the task, setting limits of task; have to allow for mistakes but not misbehavior.

If child is doing something the parent doesn't like, the behavior is considered wrong by the parent - a misbehavior rather than an error on the task - and the parent attempts to stop or change the behavior. Parental efforts at modifying child's non-intellective behavior in the social or emotional domain.

TASK MANAGEMENT - Code all of the following examples as Structuring (St).

(a) Structuring of

Definition: Global telling of what is going to happen, gestalt of the task.

Examples: "I am going to teach you how to make that boat."
"We are going to fold the paper just like on the board until we have an airplane."
"We are going to look at this book together."

(b) Structuring of Task Related Behavior

Definition: Specific behavioral directions related to task or to facilitating task. Telling child what is going to happen short of defining total task. Also action to delay child's response as a means of facilitating organization or reorganization of thought or actions.

Examples: "Fold it right here."
"Turn it over."
"Flip the page"
"Wait!" "Just a minute."

Comment: The only questions to appear under structuring are "Will you ... " questions, e.g., "Will you get me a piece of paper?"
"Would you clean the table?"

(c) Structuring with Explanation

Definition: Telling the child what to do or what is going to happen with an accompanying explanation.

Examples: "You have to crease it hard to make it stay folded."

"Take a piece of paper because we're going to make a boat."

"I can't do it for you because I'm supposed to teach you how."

(d) Structuring Rule

Definition: Setting up of the rules of an activity, game, task, use of materials or explanation of rules, or social interactions with adults and/or peers; defining the limits. This includes rules of social interaction, but deals only with setting or defining the limits, not with enforcement after the rule has been broken.

Examples: "The rule is you have to make a plane."

"What are you supposed to make?"

"The rule is we can't take those models off the board."

Comment: The only types of questions to appear under this category refer to expected actions, e.g., should you, supposed to do, need to do questions referring to the rules or the procedures of an activity: "What should you do with the paper?" "Where do you need to place the chair?"

(e) Structuring with Demonstration

Definition: Telling child what to do with the additional element of parent "showing or demonstrating."

Examples: "Fold it this way." (parent demonstrating)

"Turn it the way I'm turning mine."

"Push harder right here." (parent pointing)

CHILD MANAGEMENT - Code as high power or low power according to the following.

High Power:

(a) Power Assertion

Definition: Physical or verbal no-choice situation regarding compliance to the message; the decision is by the parent and the child is to comply; threats and warnings, or restraining the child.

Examples: "Come back to the table!"
"Don't pull those off the board!"
"Leave the phone alone!"

(1) Power Assertion with reason

Definition: Where the no-choice aspect is still present but where arbitrariness regarding demands is reduced by the parent's use of justifications or explanations..

Examples: "Come back 'cause we have to finish."
"Don't pull those off the board 'cause the lady said not to."
"Leave the phone alone so we can finish this."

Low Power:

(b) Persuasion

Definition: Techniques which give the child choice whether or not to comply; provide him with the information regarding implications of the behavior in question, and have the quality of appealing to some aspect of his psyche, e.g., conscience, self-interest; if - then relationships in behavior; threats with choice.

(1) Rational

Information provided relates the child's behavior to that which is logically appropriate to the situation.

Examples: "If you look at it, you'll be able to do it."
"If you stop yelling, I'll be able to understand you."
"If you play with the phone again, we'll never finish this."

(2) Normative

Definition: Information provided refers to a given standard.

Examples: "If you pull those off the board, you'll be doing what the lady said not to do."
"If you don't listen, we can't read the story like we're supposed to."

(3) Emotional Appeal

Definition: Appeals to child's conscience; guilt induction and the reverse, which is affirmation; statement of personal reaction to the child's action; reinforcement for following a rule or expected behavior.

Examples: "This is so much fun. Why don't you try it?"
"I'm glad you're listening so nicely."
"You make me very sad by doing that."
"That makes me mad?"
"You're not being very nice today."

(c) Suggestion

Definition: Techniques indicating the direction for the child's behavior to take with practically no pressure to comply and no arbitrariness; child's choice to comply with no pressure.

Examples: "Would you turn the light back on?"
"Would you stop crumpling the papers?"
"Would you listen instead of talking?"

(d) Use of Explanations

(1) Seeking an Explanation

Definition: Asking the child for an explanation or information in the area of social behavior, <u>after a rule infraction</u>.

Examples: "Why did you do that?"
"Why are you yelling?"

(2) Giving an Explanation

Definition: Reflection of an action, a feeling, or a state.

Examples: "Yelling disturbs everyone."
"Crumpling the papers won't get a boat made."

(e) Rule Reference

Definition: Explicit reference to an existing rule; reiteration of a rule <u>after rule infraction</u> related to the expected behavior.

Examples: "What did the lady say we should do?" (child going in and out of room)
"What did I say was the rule about taking those off the board?"

Reference Note

1. Sigel, I. E., McGillicuddy-DeLisi, A. V., & Johnson, J. E. The effects of spacing and birth order on problem-solving competence of preschool children (Final Report, Grant No. RO1 H1686, NIH). Princeton, N.J.: Educational Testing Service, January 1980.

CHILDREN'S COGNITIVE ASSESSMENT MANUAL

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1980

KINETIC IMAGERY TASK

Introduction

This task was adapted from Piaget and Inhelder's (1971) kinetic reproductive imagery task #5 (Pp. 86-94). Piaget and Inhelder found that children have difficulties imagining movements of an object going around a track. The two most common errors involve location (relationship of the moving body to the track; i.e., inside/outside, above/below) and orientation (head position in relation to the path the object is traveling). The task used in the present study assesses children's anticipation of transformations both before and after a movement has been demonstrated.

Method

Materials

Two sets of materials are used. The first set is used in the training phase of the task and the other is used in the experimental phase, after the child evidences comprehension of the task requirements.

a. Training phase materials: The apparatus used in training consists of a straight, flat board with a base 25.5 inches long (65 cm) by 6 inches wide (15.5 cm). Centered in the base is a vertical upright board running the length of the base and standing 3 inches high (8 cm) by 1-1/8 inches deep (3 cm). Five small red lights are spaced 4-1/8 inches apart (10.5 cm) in the middle of the upright board. The lights are recessed into the depth of the board, so that they are flush with its surface. The wiring for the lights is tucked into a groove running lengthwise along the back side of the board where the subject can't see them. The wires connect by means of a detachable plug into a separate control box

that allows any single light to be turned on by means of magnetic switches. The upper surface (1-1/8 inches wide, or 3 cm) of the upright board is covered with a strip of steel sheeting, so that magnets can adhere to it. At either end of the apparatus are boards 5-1/4 inches wide (48 cm) by 8 inches high (76 cm) that rise vertically from the base board and serve as legs when the board is inverted. Two identical turtles approximately 1/2 inch in diameter (1.5 cm) with magnets attached to their bases are also used as materials. A score sheet which contains schematic outlines of the apparatus used in the training and experimental phases completes the materials required for the task.

b. Experimental phase materials: The second apparatus is used in the experimental phase of the task and consists of an open figure 8 suspended lengthwise by metal tubing approximately 4 inches (10 cm) above a base board 25.5 inches long (65 cm) by 8-3/4 inches wide (22 cm). The figure 8 is two feet long (60 cm) by one foot high (30 cm) and is 1-1/2 inches thick (4 cm). The upper and lower surfaces of the track are covered by a continuous strip of steel sheeting, so that the magnets will adhere to the track. Seven small red lights are located on the outside edge of the track between the two metal surfaces. As with the training apparatus, the wiring for the lights is tucked out of sight along the back of the figure 8, and can be connected to the control box.

Procedure

Each child is seen individually. The child and the examiner sit side by side at a low table. The procedure consists of two phases: (1) a training phase to ensure that the child understands the task requirements, and (2) the testing phase.

a. Training phase procedures: The training board is placed on the table directly in front of the child, within easy reach. The board is plugged into the control box, which is located on the floor under the table by the examiner's feet, where the child can't see it. Child and examiner sit side by side. One of the turtles is placed at the extreme left of the training track. The examiner demonstrates that the turtle can only "walk" forward, first by "walking" her/his fingers along the track, and then by moving the turtle from one to another of the 5 lights, which the examiner turns on one after another. After such demonstration, the child is given the other turtle, which is for his/her own use. The child is taught to duplicate the performance of the examiner, and learns to place his/her turtle on the track at the appropriate place when any of the lights are on. Any errors of location and orientation are corrected as they occur so that the child completes the training phase with a clear concept of the task requirements.

After training the child on the upright board, the examiner turns the apparatus over so that it rests on its legs. This relocates the metal track from the top of the apparatus to the underbody of the apparatus. Now the turtle must hang upside-down in order to "walk" along the track. This is necessary in order to train the child for the appropriateness of the upside-down locations that will take place in the upper loops of the figure 8. The child redemonstrates her ability to walk the turtle along from light to light in this upside-down orientation using the same procedures as before. Again, errors of location and orientation that may arise from the altered arrangement of the apparatus are corrected, so that the child understands that the turtle has a somewhat flexible range of movement.

b. Experimental (testing) phase procedures: The testing phase begins immediately upon completion of the training phase. The materials used in training are removed from view. The figure 8 is plugged into the control box and placed on the table where the training board had been. The examiner places one turtle above the lower left light, on the track, facing to the right. As in the training phase, the examiner explains that the turtle can only go forward, and demonstrates this by "walking" her/his fingers a short distance around the nearest loop of the figure 8. Without further demonstration or explanation the child is encouraged to take the other turtle and place it on the track at the various appropriate locations as the examiner turns each light on in a random sequence. No feedback is provided for any of the trials. The location and orientation of the turtle's placement at each light is recorded by the examiner on the diagrammatic answer sheet.

After these initial 6 trials, the examiner demonstrates for the child the correct placement of the turtle at each light by moving one turtle from light to light in sequence. The child is invited to copy this procedure by doing it himself/herself. Then the 6 trials are repeated but in a different random order, without further demonstration or feedback. The child's placements of the turtle are again recorded by the examiner on the answer sheet.

Scoring

The two sets of trials are scored. Each item is scored separately in terms of success versus failure in placement.

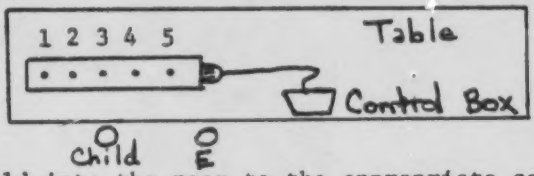
KINETIC IMAGERY TASK

Crib Sheet for E

Materials needed: Training board, Figure 8 apparatus, control box, power bar, score sheets, pencil, turtle magnet, 2 round flat (kitchen) magnets

A. Training Phase (Upright board)

1. Before child enters the room, put the training board on the table directly in front of child's seat. Plug it into the control box, which is then placed on the floor or on a low chair by E's side, where child can't touch it, but E can manipulate the lights.



2. Bring child into the room to the appropriate seat.

3. Place one turtle on the left end of the metal track.

"The turtle can only go forward, like this. His head always looks this way too. (Demonstrate by walking your fingers to the other end of the track.)

"Show me how the turtle goes." (Child walks his/her own fingers.)
"Now let's pretend the turtle is going for a walk. When he comes to a red light he must stop."

4. Turn on light 5.

"Where should he stop? Show me with your finger." (Child points. Correct the child if necessary. Pick the turtle up and place him directly above 5 on the track. DO NOT SLIDE HIM ALONG THE TRACK OR 'HOP' IT ALONG. If child points to light and not to track, say, "That's where the light is, but where are you going to put the turtle?"

5. Return turtle to starting point, explaining to child:

"When the light goes out (turn light out), the turtle must go back here."

6. Turn on light 2.

"Show me where he'd stop." (Child points).
"Put your turtle there." (If child slides the turtle along the track, say "No, don't slide it. I want you to pretend the walking in your head." The child must be trained from the beginning to point to the place where the turtle goes with one hand and then to move the turtle there with the other hand. This eliminates the sliding habit. In any case, DO NOT ALLOW CHILD TO SLIDE THE TURTLE.)
"Is that where his head would be looking?" (Child responds. Correct the location and orientation of the turtle if necessary.)

7. Turn the light out; have child return turtle to starting point. THIS MUST BE DONE AFTER EVERY ITEM.

8. Turn on light 4; Repeat exact procedures in steps 6 and 7.

9. Turn on light 1; Same procedure.

10. Turn on light 3; Same procedure.

B. Training Phase (Inverted board)

1. Say to child,

"Now the turtle is going to do something really funny!

2. Turn training board over, so track is underneath with the lights still facing towards the child. Place turtle on the left end of the metal track, as before. He will now be hanging upside down.

3. Turn on light 2.

"Now where will the turtle stop for the red light?" (Correct the child if necessary. If child tries to place the turtle right side up instead of upside down, say, "No, the turtle can't bump his head."
"Is that where his eyes would be looking?"

4. Turn the light out; have child return turtle to starting point.

5. Turn on light 4; Same procedure.

6. Turn on light 1; Same procedure.

7. Turn on light 5; Same procedure.

8. Turn on light 3; Same procedure.

C. Testing Phase (First administration)

1. Replace the training board with the Figure 8 apparatus. Place turtle above light A, facing to the right.

"Let's pretend the turtle is going to take a walk. He can only go this way." (Walk your fingers a short distance, but not to the top of the track.)
"When he sees a red light he must stop."

2. For the following trials, give no feedback and do not engage in any extraneous chatter. Simply turn on the light, have child point to where the turtle should go, child places turtle, record response on score sheet, turn out light, child returns turtle to starting point. Do not ask about orientation of turtle's head, even if it is placed incorrectly.

TRIAL 1: Turn on light B.

"Show me where the turtle will stop for that light." (Child points.)
"Put the turtle there." (Record location and orientation on the score sheet. Do not give any feedback. Have the child return the turtle to the starting point.)

TRIAL 2: Light F; same procedure.
TRIAL 3: Light C; same procedure.
TRIAL 4: Light G; same procedure.
TRIAL 5: Light E; same procedure
TRIAL 6: Light D; same procedure.

D. Testing Phase (Second administration)

1. E now takes the turtle at the starting point and slides it slowly in sequence from lights B to G, then back to the starting point, making sure child is attending to the demonstration.

"Now I'm going to take the turtle for a walk all around the board. Watch where he stops at each light so you can do it."

2. Have child repeat step 1 by him/herself.

"Now you do that."

3. Readminister the 6 trials, in the following new order. Make it clear to the child that he may no longer slide the turtle, should he attempt it.

"Now we're not going to slide him any more. You're going to show me where the turtle stops at each light again."

TRIAL 1: Light G
TRIAL 2: Light B
TRIAL 3: Light E
TRIAL 4: Light C
TRIAL 5: Light F
TRIAL 6: Light D

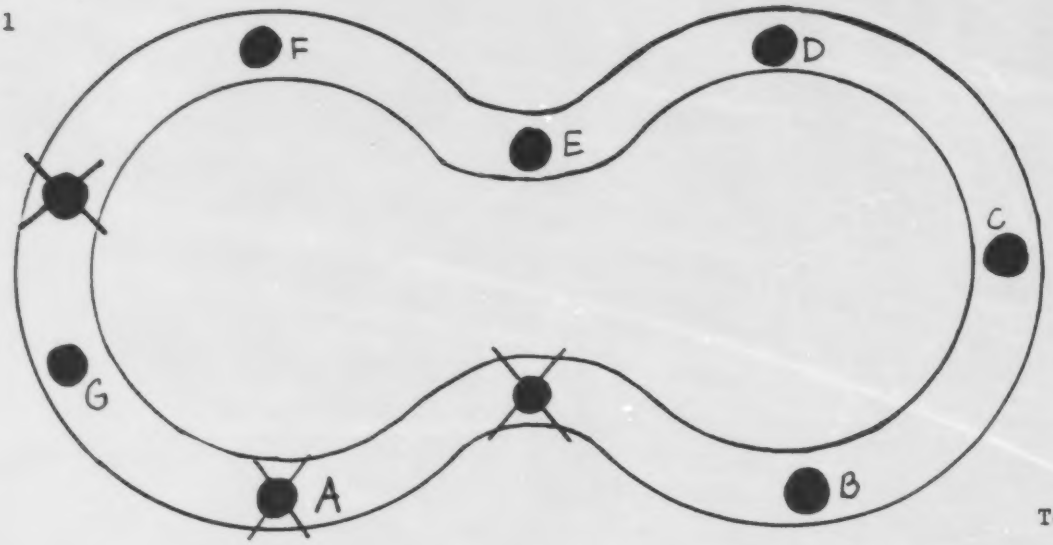
Kinetic Imagery Task

Subject I.D. _____

	Yr.	Mo.	Day
Test date	___	___	___
Birthdate	___	___	___
C.A.	___	___	___

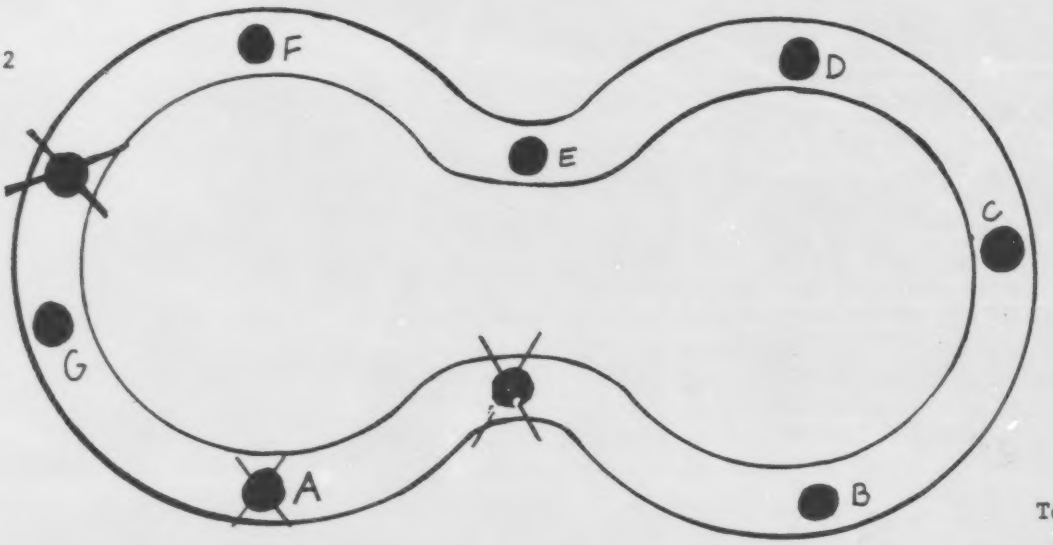
Session # _____ Examiner _____

Trial 1



Total _____

Trial 2



Total _____

Mental and Sequencing Transformations (MAST)

Introduction

This task was originally created for this program by the Principal Investigator. The purpose of the MAST is to evaluate children's mnemonic skills with meaningful and nonmeaningful material, where meaningful material (pictures of familiar objects)allows for rehearsal, and the nonmeaningful material (various forms) reduces that possibility. Thus, we can obtain an estimate of mnemonic competence.

The first part of this task is to present the stimuli to be remembered horizontally with the responses presented in the same direction. (See below for a precise description of procedure.) The second part of the task involves presentation of mnemonic stimuli vertically, but the response cards are to be presented horizontally. The argument is that this procedure requires mental transformations since the child has to rotate mentally the presented stimuli in order to present the array horizontally.

By using the two sets of materials (pictorial and geometric) we are also assessing mnemonic competence in two types of symbol systems. The task does not require verbal communications skills. Thus, we are evaluating children's memory skills where language production requirements are minimal.

Materials

An easel, two notebooks (one for Horizontal tasks; one for Vertical tasks), file box containing response cards, score sheets, and a pencil are used as materials.

Procedures

1. Before child enters the room, put the easel on the table directly in front of child's seat. Place the Horizontal notebook in position on the

easel, open to the first blank divider.

2. Seat the child in front of the easel, within easy reach.

"I'm going to show you some pictures." (Open notebook to Item 1. Look at second hand on the clock and begin timing 10 seconds.)

"Look really hard. This one goes first, then this one." (Point with your finger to each figure in sequence.)

"Soon I'm going to take the pictures away. I want you to remember how they went so you can put them back the same way."

3. After 10 seconds (including instruction time), remove the stimulus from view by turning to the next blank page. Arrange response cards for Item 1 in prescribed order on the table in front of the child.

"Show me the ones you saw before." (Child responds.) "Did you see this one before? No. This one is not right. Let's leave it here."

"Which one came first?" (Child responds.)

"Then we'll put it first here." (Place the card child selects on lower rack of the easel, to the left.)

"Which one came next?" (Child responds.)

"Then we'll put it here." (Place the card to the right of the first card.)

"Is that the way they were; this one first, then this one?" (Child responds.) Record final placement by numbering above each response on score sheet.

4. Re-expose stimulus.

"Let's take a look."

(a) "Good for you! This one is first and this one is next." (Point)

(b) "No. You got the right pictures, but not in the right order." (Rearrange cards into correct order and demonstrate comparison between stimulus and correct response by pointing.)

5. Turn to Item 2.

"Let's do another one. Here are some more pictures. Look at each one carefully so you remember this one first, then this one." (Point)

"Look really hard. Soon I'm going to take the pictures away."

6. After 10 seconds, remove stimulus from view. Arrange response cards in the prescribed order.

"Show me the ones you saw before." (Child responds.)

"Which one came first?" (Child responds.)

"Then put it here." (Point)

"Which one came next?" (Child responds.)

"Put it there." (Point)

"Is that the way they were; this one first, then this one?" (Child responds. Record on score sheet as above.)

7. Re-expose stimulus.

"Let's take a look."

(a) "Good for you! This one is first and then this one." (Point)

(b) "No. You got the right pictures, but not in the right order." "Put the cards in the right order, like this." (Point to stimulus card. Have child rearrange the cards, using the stimulus as a model.)

8. Repeat this procedure for Items 3 through 10. These are the actual test items, so do not give any feedback. Record the child's final arrangement of the cards for each trial. If the child includes a distractor item in 2 consecutive trials (or for any 3 of the 8 test trials) record order of placement, then terminate phase A and go on to B. (Distractor items have boxes around them.)

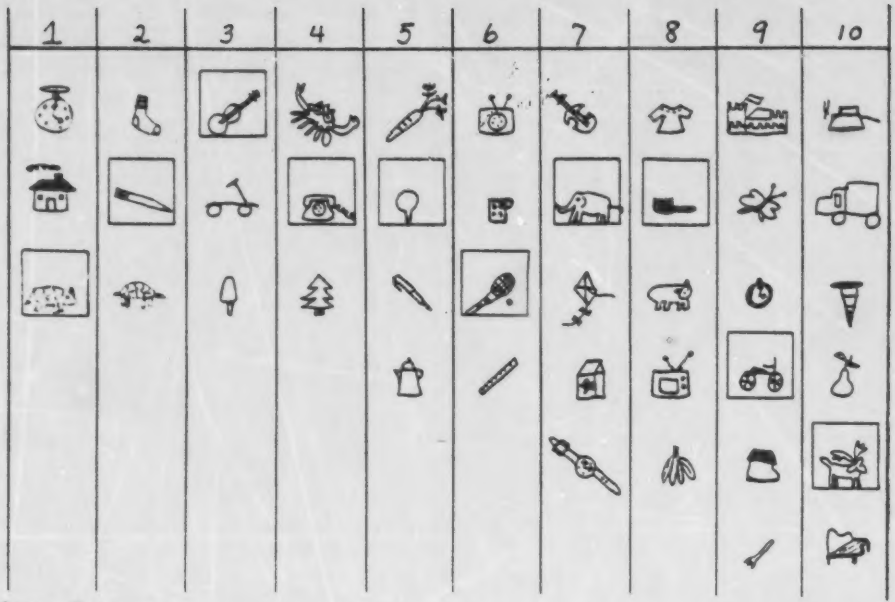
9. The same procedures as above are used for geometric horizontal, pictorial vertical and geometric vertical materials. Each time you begin one of the four sections, repeat the detailed instructions for the first 2 items all over again, including the checking back to see if the answer is correct.

VERTICAL MAST

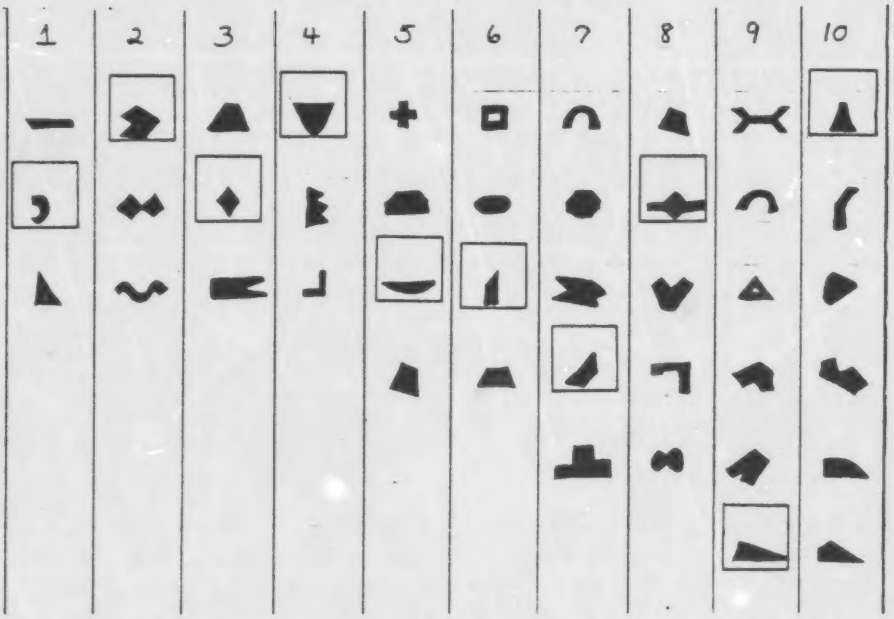
Subject I.D. _____

	Yr.	Mo.	Day
Test date	____	____	____
Birthdate	____	____	____
C.A.	____	____	____

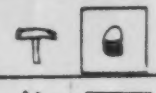
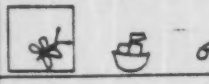
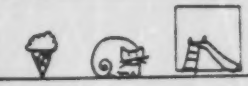
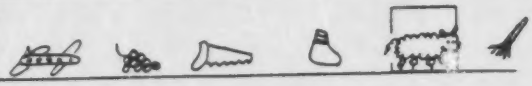
Session # ____ Examiner ____



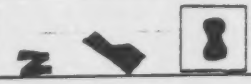
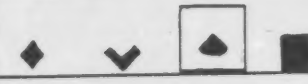
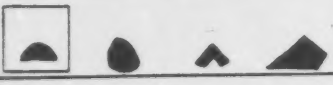
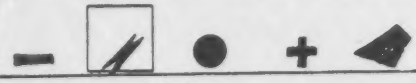
	1	2	3	4	5	6	7	8	9	10	TOTALS
Absolute Score											
Sequenced Pairs											



	1	2	3	4	5	6	7	8	9	10	TOTALS
Absolute Score											
Sequenced Pairs											

		Absolute Score	Sequenced Pairs
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

TOTALS

		Absolute Score	Sequenced Pairs
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

HORIZONTAL MAST

Subject I.D. _____

	Yr.	Mo.	Day
Test Date	___	___	___
Birthdate	___	___	___

C.A.

Session # ____ Examiner ____

TOTALS

Mental Rotation Task

Introduction

Information processing theorists have attempted to infer imaginal processes used to solve spatial rotation problems from reaction time and error analyses. In 1974, Cooper and Shepard presented data that suggested that adults solve such problems by forming an image of the object in question, then transform this image mentally to arrive at some conclusion about the object. These authors presented adults with a configuration rotated a discrete number of degrees. The subject's task was to indicate whether this configuration was identical to, or a mirror image of, a known configuration which the subject was instructed to imagine at 0°. It was found that reaction time was a linear function of degree of rotation. Cooper and Shepard therefore posited that adults solve rotation problems through a process of mental rotation, analogous to rotation as it occurs in the physical world.

Marmor (1975) adapted these procedures for use with children as young as four years of age. Her modifications include a training phase which is largely nonverbal and specifically tests how well children understand their instructions. Linear reaction time trends were obtained for children in two investigations of children's kinetic imagery (Marmor, 1975, 1977). Marmor concluded that children, like adults, solve rotation problems via mental imagery and that the major developmental changes involve increasing efficiency of mental rotation. Other researchers who have used this paradigm suggest that children's kinetic images reflect spatial understanding that changes with development (Dean & Harvey, 1979).

This task was adopted, with some minor modifications, for the present study in order to investigate whether language disordered children would

also evidence a linear reaction time trend. It is hypothesized that such children solve rotation problems similarly to other children, that is, through a process of mental rotation. Analysis of individual differences in reaction time and error analysis will enable investigation of differences in the development of spatial knowledge that may occur for children with a language handicap.

Materials

Two sets of materials are used. The first set consists of three panda bears, approximately 15 cm x 7 cm, made out of plywood and 24 slides of upright bears. The second set of materials consist of 60 slides of pairs of bears, a slide projector, a 21.5 cm x 21.5 cm screen, reaction time levers, and a microprocessor that controls slide projection and records reaction time and correct selections. All bears are depicted with either their left or right arm raised.

Procedure

All children are tested individually. The test is administered in two sessions. In the first session the child is trained on same-different judgments and a criterion test is administered. If the child fails the criterion test, the session is terminated and the second session is omitted from the test battery. If the child passes the criterion test, the child is given mental rotation training and then 30 of the test items during the remainder of the first session. At the second session the child is again given the mental rotation training and the final 30 test items are administered.

The three plywood bears are used to train same-different judgments. Two of the bears have the same arm raised and one bear has his other arm raised. Through demonstration, explanation and corrected practice, children are taught

to discriminate between same and different pairs. The ability to discriminate is then tested with the criterion tests. Twenty-four slides, half with same-pairs of bears and half with different pairs, are presented in random order. The child pushes the lever on the left when stimuli are the same and the other lever when they are different. The microprocessor records the answer automatically and holds it in memory. If the child responds correctly on either the first 10 consecutive trials or 20 of the 24 trials, output is printed and mental rotation training trials are administered.

During mental rotation training, the children are given seven trials with two of the plywood bears. The bears are presented with one upright and one rotated. The child presses a lever to indicate some-different judgments and the experimenter manually rotates the bear to the upright position to check whether the two stimuli match. For the remaining rotation trials, the child is allowed to rotate the bear after the lever has been pushed in order to check his/her answer.

The total 60 test trials consists of six slides of 0°, 30°, 60°, 120° and 150° clockwise rotations of the bear on the right hand side of the screen. The bear on the left is always depicted as upright. The order of these 60 slides was randomized and 30 are administered immediately upon completion of mental rotation training. The intertrial interval between slides was one second, during which an ambient colored slide is projected. For half of the trials, the bears are the same and they differ for the other half. Reaction time in hundredths of seconds as well as errors are recorded and printed out by the processor.

During the second session, all children who passed the criterion test are again given mental rotation training. The remaining 30 test trials are then administered.

TEDDY BEAR TASK

Examiner's Instruction Sheet

Materials: Printer, control unit, response button unit, slide projector, screen, slide carousels (3), 4 pretraining plates, 7 mental rotation training plates.

General Features

This task is administered to each subject in two sessions. Each session includes the criterion test (Carousel A) and one of the two mental rotation trays (either Carousel B or C). Session 1 demands extensive training of the child for both parts of the test: pretraining for same/different concept and mental rotation training. Session 2 begins with presentation of Carousel A without pretraining, as the child will be familiar with the requirements of the task and will have previously passed the criterion test anyhow. Carousel A is simply repeated to remind the child about the task. Mental rotation training is repeated in exactly the same fashion at both sessions.

For both sessions, the following list of procedures must be rigidly adhered to for checking out the functioning of the equipment. This will reduce the chance of any mechanical failure during the session, which could render the data useless. Run through this checklist before the child is brought to the room.

(a) Plug projector and printer into electrical outlet.

(b) Turn projector on. Check to see that the bulb is working. Replace if necessary. (Spare bulb is stored in cupboard in test room.)

(c) Place Carousel A onto projector at "0" so first slide is ready to project. (Slide carousels can only be attached or removed from projector when projector is on and in the "0" position.) Show first slide on the screen by operating manually. After checking out slides, manually return to "0" position.

(d) Turn off projector.

(e) Check roll of paper in printer by lifting up black cover on unit. If low, replace roll. (Spare rolls are stored in cupboard in test room.)

(f) Make certain that enough paper is feeding out of the printer so that it won't jam during the session. To advance paper, press red reset button on front of printer unit. (Printer must be on.)

(g) Turn on printer by using toggle switch at back of unit. Printer will print the words "Teddy Bear Task" and stop. Check the printing for clarity. If printing is illegible or "double printing" (writing over itself) the roll of paper is probably jammed and curling back up on itself. Free the paper. Turn the printer back on and check the printing again, until it clears.

(h) After printer is turned on, the display on the control unit (red lights) will say "A = ID?" Enter the first subject's ID number (from subject file folder). Leave the number on the display and do not push any other buttons on the control unit. This leaves the apparatus ready for immediate display of Carousel A without preparation in front of the child, who would be distracted otherwise.

NOW YOU ARE READY TO BEGIN THE SESSION.

A. PRETRAINING PHASE (8 trials)

1. Seat child at end of table, facing the screen, with response button unit within easy reach.

ITEM 1 (Same-up)

2. Show child the first pretraining plate (Same, #1).

"Are these teddy bears the same or not the same? Look at their mittens."

(If right) (a) "Yes, that's right. Why?" (Whatever child responds, say:)

"They both have the same arm up. When you see bears like this that both have a mitten up, they are the same and I want you to push this button." (Demonstrate pushing blue panel on response unit. Have child do it.)

(If wrong) (b) "Why?" (Whatever child responds, say:)

"They both have the same arm up. When you see bears like this that both have a mitten up, they are the same and I want you to push this button." (Demonstrate - blue panel. Have child do it.)

ITEM 2 (Same-down)

3. Show child the second pretraining plate (Same #2).

"Are these teddy bears the same or not the same" Look at their mittens."

(a) "Yes, that's right. Why?" (Whatever child responds, say:)

"They both have the same arm down. When you see bears like this that both have a mitten down, they are the same and you push this button."

(Point to blue panel and have child push it.)

(b) "Why?" (Whatever child responds, say:)

"They both have the same arm down. When you see bears like this that both have a mitten down, they are the same and you push this button." (Point to blue panel and have child push it.)

ITEM 3 (Left-up right-down)

4. Show third pretraining plate (Different, #1).

"Are these teddy bears the same or not the same?"

(a) "That's right; they're not the same. Why not?" (Whatever child responds, say:)

"This one has his mitten up and this one has his mitten down, so they are not the same. When you see two bears like this that are not the same, push this button." (Demonstrate - silver panel. Have child do it.)

(b) "Why not?" (Whatever child responds, say:)

"This one has his mitten up and this one has his mitten down, so they are not the same. When you see two bears like this that are not the same, push this button." (Demonstrate - silver panel. Have child do it.)

ITEM 4 (Left-down right-up)

5. Show fourth pretraining plate (Different, #2)

"Are these teddy bears the same or not the same?"

(a) "That's right; they're not the same. Why not?" (Whatever child responds, say:)

"This one has his mitten up and this one has his mitten down, so they are not the same. When you see two bears like this that are not the same, push this button." (Point to silver panel and have child push it.)

(b) "Why not?" (Whatever child responds, say:)

"This one has his mitten up and this one has his mitten down, so they are not the same. When you see two bears like this that are not the same, push this button." (Point to silver panel and have child push it.)

ITEMS 5 THROUGH 8

6. Explain to child:

"Now I want you to look carefully at each one, decide if it's the same or not and push the right button. Ready?"

Re-show each of the 4 plates in the following order. Correct child if necessary, with appropriate explanation:

(a) Plate #2 (Same-down)

(b) Plate #4 (Left-down/right-up)

(c) Plate #3 (Left-up/right-down)

(d) Plate #1 (Same-up)

B. CRITERION TEST (24 trials - slides, untimed)

1. Turn on projector.

"Now you can play the teddy bear game. You are going to see some pictures on this screen just like the ones we've been looking at. LOOK (E points to screen), DECIDE if they are the same or not (E touches her own head with finger), and PUSH a button (E points to the button unit). What are you going to do?" (Get child to respond with words or gestures.)

"Which button is the same?" (Child responds.)

"Which button is not the same?" (Child responds.)

"O.K. Here we go!"

2. Press "continue" button on control unit. The first slide will project. These slides stay until a button is pressed, so if child is confused or unable to decide, prompt him/her through the first 2 by using as many of the following probes (in order) as necessary:

(a) "Are they the same or not the same?"

(b) "Do they both have a mitten up?"

(c) "Does one have a mitten up and one have a mitten down?"

(d) "Which button is not the same?"

If child still does not respond appropriately, explain what you're doing and why as you look, decide, and push the correct button on the first slide. Encourage child to do it him/herself on the second slide. If no response, repeat procedure on second slide. After that, provide no help or feedback except:

"Are they the same or not the same?", or

"Look, decide, push.",

if child looks to you for help or becomes unable to proceed on his/her own.

Child must pass 20 out of the 24 trials in order to successfully complete the criterion test. If he/she gets the first 10 correct, the printer will stop and print "First 10 correct." Criterion test is over. Proceed to Mental Rotation Training.

If child gets 20 out of 24, the test will continue to the end. You will need to print out the results to see if criterion was passed.

If child fails 5 trials anytime during the test, the printer will stop and print "5 errors." The criterion test has been failed and is over. Repeat complete pretraining sequence and administer Criterion test a second time.

C. MENTAL ROTATION TRAINING (7 trials)

1. Turn projector light off; leave fan running a few minutes to cool machine while you go on to this phase of the session.

"You did so well on that game, that now I'm going to make it just a little bit harder!"

2. Show first MRT plate. (Left-up/right-down, 30°)

"Now, are these bears the same or not the same?" (Child responds.)

"Let's see if you are right." (Rotate bear to upright position.)

"Are they the same or not the same?" (Correct child as necessary.)

"You see? Even though this teddy bear is turned, this one has his mitten up and this one has his mitten down, so they are different.

3. Show second MRT plate. (Right-up/right-up, 120°)

"Are these bears the same or not the same? Turn this bear in your head." (Child responds.)

"Let's see if you are right." (Rotate bear to upright position.)

"Are they the same or not the same?" (Correct child, as necessary.)

"You see? Even though this teddy bear is turned, this one has his mitten down, so they are different."

4. Repeat this procedure on the remaining 5 plates. Let the child turn the bear to upright, but make certain that he has made his/her guess first. Correct and give feedback on each of the 7 items.

D. EXPERIMENTAL PHASE (30 trials at each session)

1. Replace Carousel A with either B or C. (Check counterbalancing order for your session in advance.)

2. Push "Test" button (if necessary) on control unit so that it registers the correct phase (B or C). Display will either read "B = ID?" or "C = ID?" You do not need to re-enter ID# if you have already done so during the session.

3. Turn projector on.

"Now I'm going to show you some pictures that look like the ones we've been looking at. Remember to LOOK, DECIDE and PUSH a button. Don't waste time or talk to me until all the slides are over.

Give no feedback during this phase. Discourage conversation and do not answer questions unless absolutely necessary. Refocus child to look, decide and push if necessary. Move out of child's line of vision with your chair so you do not become a distraction.

CLOSING PROCEDURES

Turn off projector bulb. Leave fan running a few minutes while you clean up for the next task.

Press "Test" button until printer begins printing. When printing is completed, tear off the paper, write child's first and last name on it and the date. Place this in the child's folder. (Note: If you were doing Carousel C, the printer will begin printing automatically without need to press "Test.") NEVER LEAVE THE DATA UNPRINTED DURING OTHER TASKS. PRINT OUT IMMEDIATELY OR DATA WILL BE LOST IN THE EVENT OF A POWER FAILURE OR HUMAN ERROR.

Unplug printer and projector from electric outlet. This protects the equipment in case of unexpected power surges, a real hazard at ETS during rain storms.

Replace all Carousels in their proper storage containers, with the silica gel containers on top to prevent moisture build-up which can destroy the slides. Seal containers.

Visual-Auditory Sequential Memory ("Simon")

Introduction

A commercial game produced by Milton Bradley Company under the name "Simon" will be played by children as a break during the WPPSI administration. It is actually a memory game in which children repeat ever increasing random signals generated by "Simon." The number of items in sequence children recall correctly will be scored.

Materials

"Simon" is a round plastic game with four colored panels arranged around a control panel. After pressing the START button on the control panel, one of the panels is illuminated, accompanied by a tone. The player repeats the signal by pressing the same color panel. The first signal is then duplicated and another signal is added. The game continues in this manner until the player presses a panel out of sequence. At the end of the game the last sequence can be replayed in full by pressing the LAST button on the control panel.

Procedure

Training: Before turning "Simon" on, the experimenter demonstrates where to press the panels. The experimenter first presses the red START button. Following the sequences "Simon" sets, the experimenter plays the game. If the child appears confused and lost, another sequence is played by the experimenter with the child watching. When the child responds and is eager to participate, the experimenter plays "Simon" with the child. The child is helped to follow the sequence, the experimenter pushing some panels and the child pushing some with the experimenter's participation gradually withdrawn.

Test Trials: The START button is pressed and a new sequence is begun. The child attempts to complete sequence him/herself. Sequence number correct, and number of errors are recorded by the experimenter. This procedure is followed for a total of three games. The child's highest level of performance will be used in analyses. The test is discontinued after three trials with no successes on the child's part.

Seriation

Rationale

The purpose of this task is to determine the children's ability to order stimuli serially along familiar dimensions, e.g., size. The mental operation involved is asymmetrical classification. Seriation, according to Piaget, begins to appear at the preschool level. Seriation is an important precursor for acquiring arithmetic concepts.

Materials

This task consists of twelve 9 x 11 inch pieces of white cardboard enclosed in plastic. Each piece of cardboard presents a schematic outline of an object in three distinct locations, with a blank space for a fourth object. A set of four 3 x 3 inch response cards, each depicting one object, accompanies each matrix. A tabletop easel and a shelf, 23" x 15½" also serve as materials.

Procedure

The task is divided into two phases, a training phase and a test phase. Four items comprise the training phase and eight are used for testing.

The training items involve presentation of two one-way classification problems and two problems of seriation along one dimension. The experimenter and the child sit side-by-side at a low table with the easel directly in front of the child. The shelf is placed on the table directly in front of the easel. The experimenter places the first training item on the easel (two large red clocks and a small red clock) and says, "Here is a big clock, here is a big clock, here is a little clock and here there is no clock" while pointing to the appropriate pictures. The experimenter then places the four response cards on the shelf in the order designated by the number

on the back (a random order across trials). The experimenter says, "One of these is the best one to go here," pointing to the empty cell of the matrix. "Which one should go here?" Each response card is pointed to separately in order to direct the child's attention to each option. If the child chooses the correct response card, the experimenter says, "Very good. That is the best one." If the child chooses an incorrect response card, the experimenter provides feedback by exchanging it for the correct card and pointing out that each big red clock goes with a small red clock.

The stimulus card and response cards are removed from view and a matrix depicting three trees is placed on the easel. The experimenter says, "This tree has a fat line, this tree has a skinny line and this tree has a fat line" while pointing to the appropriate pictures. The four response cards are displayed on the shelf and the experimenter asks, "Which tree should go here?", pointing to the blank space. Feedback is provided.

The same procedure is then followed for the two seriation training items. One item depicts three leaves in a column that are progressively smaller, with a blank space between the first and second leaf. The experimenter says, "Here is a big leaf and a small leaf and a very, very small leaf. Here there is no leaf," while pointing to the appropriate picture. Four response cards are displayed on the shelf. The child is asked to pick the one that goes in the blank space and feedback is provided. The second seriation item depicts three bottles with progressively less liquid, and a blank space. The child is told that there is a lot of juice in one bottle, a little juice in one and very very little juice in one. Again, response cards are presented and feedback is provided.

The child's first choice for each of the training items is recorded by checking off the response card selected on a scoring sheet that depicts the four response options.

The testing phase follows immediately upon completion of the training phase. Each stimulus card is placed on the easel in turn, with the appropriate response cards on the shelf below it. The experimenter asks, "Which one goes here?" pointing to each of the four response cards and then the blank space. No feedback is provided during the test trials. The child's selection is recorded on an answer sheet in the same manner as during training trials.

SERIATION

Examiner's Instruction Sheet

Materials: 7 Seriation plates, response cards (contained in a file box), tabletop easel, score sheet, pencil.

Training Phase (3 Items)

1. Seat child in front of the easel.

ITEM 1 (Clocks)

"I'm going to show you some pictures." (Place Item 1 on the easel's top shelf.)

"Here is a very little clock, here is a little clock, here there is no clock, and here is a big clock." (Point to appropriate pictures.)

"Which clock is little?" (Correct if necessary)

"Which clock is big?" (Correct if necessary)

2. Place the four response cards for the item on the lower shelf of the easel in the designated order.

"One of these is the best one to go here." (Point to blank space in array.)

"Which one should go here?" (Point to each one of the response cards in sequence in order to direct child's attention to all options.)

(a) If child chooses correct response, say:

"Very good! That is the best one. Why?" (Expand child's answer, if necessary, to include the relevant size dimension, by saying:

"They're getting bigger, aren't they?")

(b) If child chooses wrong response, say:

"Let's take another look. This one is the right one. They're getting bigger." (Place the correct answer in the blank space and explain why it fits. Show how all the other cards match one of the three clocks in the array.)

3. Mark child's original response on score sheet. Remove materials from easel.

ITEM 2 (Leaves)

4. Place Item 2 on upper shelf of the easel.

"Here is a big leaf, here there is no leaf, here is a little leaf, and here is a very little leaf."

"Which leaf is big?" (Correct)

"Which leaf is little?"

Place the four response cards on the lower shelf of the easel.

"One of these is the best one to go here." (Point to blank space in array.)

"Which one should go here?" (Point to each one of the response cards in sequence in order to direct child's attention to all options.)

(a) "Very good! That is the best one. Why?" (Expand child's answer, if necessary, by saying:

"They're getting smaller.")

(b) "Let's look again. This is the right one. They're getting smaller." (Place correct answer in the blank space and explain why it fits. Show how all the other cards match one of the other three leaves in the array.)

5. Clearly mark the child's original selection on the score sheet. Remove stimulus and response cards.

ITEM 3 (Bottles)

6. Place Item 3 on the upper shelf of the easel.

"This is a lot of juice, here there is no juice at all, this is a little juice, and this is very little juice." (Point to appropriate pictures.)

"Which is a lot of juice?" (Correct, if necessary)

"Which is a little juice?"

7. Place the four response cards for the item on the lower shelf of the easel in the designated order.

"One of these is the best one to go here." (Point to the blank space in the array.)

"Which one should go here?" (Point to each one of the response cards in sequence.)

(a) "Very good! That is the best one. Why?" (Expand child's answer, if necessary, by saying:

"The bottles are getting empty, aren't they?")

(b) "Let's take another look. This one is the best one. The bottles are getting empty." (Place the correct answer in the blank space and explain why it fits.)

8. Mark the child's original answer on the score sheet. Remove stimulus and response cards.

Testing Phase (4 Items)

Each stimulus card is placed on the easel in turn, with the appropriate response cards on the shelf below it.

"Which one goes here?" (Point to the blank space. If child is not attending to the four response cards, point to each one in turn to make sure child is considering each option. Give no feedback during the test trials. The child may try out as many responses as s/he pleases until s/he selects a final choice. Mark his/her selection on the score sheet, remove the cards and present the next item.)

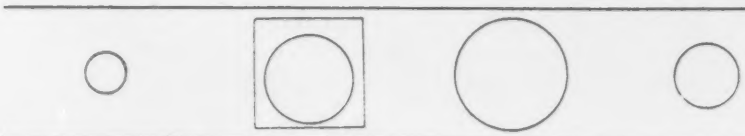
Seriation Task

	Yr.	Mo.	Day
Test date	___	___	___
Birthdate	___	___	___
C.A.	___	___	___

Subject I.D. _____

Session # _____ Examiner _____

1. Red Clocks

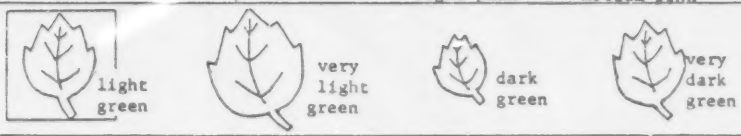


2. Leaves

3. Red Bottles

4. Tulips

5. Multi-colored Leaves



6. Houses

7. Purple Bottles

Total

Memory for Sentences

Introduction

The Memory for Sentences is a companion measure to the MAST. The purpose of this task is to assess children's memory for sentences using picture arrangements as the response measure. The task does require the child to transform an orally presented sentence in ordered pictorial representations. This task assesses verbal memory with no demand for cognitive production.

Materials

An easel, picture cards, score sheet and pencil are needed.

Procedures

For each item, the experimenter reads the child the "story" without the picture cards in view. Then the cards are arranged on the table in prescribed (scrambled) order. The child's task is to rearrange them in proper sequence, as the story is told.

MEMORY FOR SENTENCES TASK

Examiner's Instruction Sheet

Materials: Picture cards (contained in file box), tabletop easel, score sheet, pencil.

Training Phase (3 items)

1. Seat child in front of blank easel.

"Now I'm going to tell you some stories. Listen very carefully. I'm going to give you some pictures and you tell the story with the pictures just the way you heard it."

ITEM 1 "Let's try it. Here's the first story." (Read the two sentences of item 1.)

2. Place the response cards flat on the table in front of the child.

"Make these pictures tell the story the way you heard it. What happened first?" (Child verbalizes or points to a card. Place that card up on the bottom shelf of the easel.)

"What happened next?" (Have child place the second card on the shelf to the right of the first one.)

"Do the pictures tell the story you heard?" (Child responds.)

"Now I'll tell you the story again. You see if your pictures tell the story just the way it happened." (Read the two sentences. Have child correct the order of his/her card placement if necessary.)

3. Record the child's original placement of the cards on the score sheet by numbering the sequence in the appropriate blanks. Remove the cards.

ITEM 2 4. "Here is the next story." (Read the two sentences of item 2.)

5. Place the response cards flat on the table in front of the child.

"Make these pictures tell the story the way you heard it. What happened first?" (Child verbalizes or points to a card. Have him/her place the appropriate card on the bottom shelf of the easel.)

"What happened next?" (Have child place the second card on the shelf to the right of the first one.)

"Do the pictures tell the story you heard?" (Child responds.)

"Now I'll tell you the story again. See if your pictures tell the story just the way it happened." (Read the two sentences. Have child correct the order of his/her card placement if necessary.)

6. Record the child's original placement of the cards on the score sheet by numbering the sequence in the appropriate blanks. Remove the cards.

ITEM 3

7. "Here is the next story." (Read the three parts of item 3.)

8. Place the response cards on the table in front of the child in the prescribed order.

"These pictures are all mixed up. Make them tell the story just the way you heard it. What happened first?" (Child verbalizes or points to a card. Have him/her place the appropriate card on the bottom shelf of the easel.)

"What happened next?" (Have child place second card to the right of the first one.)

"Then what happened?" (Have child place last card to the right of the second one.)

"Do the pictures tell the story you heard?" (Child responds.)

"Now I'll tell you the story again. Look at your pictures and see if they tell the story just the way it happened." (Read the story. Help child correct the order of his card placement, with explanation, if necessary.)

9. Record the child's original placement of the cards on the score sheet by numbering the sequence in the appropriate blanks. Remove the cards.

Testing Phase (5 items)

Each story is told in turn, with no stimuli in view. Make certain child is attending carefully. Place the response cards on the table in front of child.

"These cards are all mixed up. Make them tell the story."

After child has arranged cards on the bottom shelf of the easel, record the order of placement on the score sheet, remove cards and continue on to the next item until all are completed. Give no feedback.

ID #_____ Session #_____ Examiner_____ Test Date ____ ____ ____

Yr Mo Da

Birthdate ____ ____ ____

C.A. ____ ____ ____

Memory for Sentences

ITEM 1.	a)	The boy is on a bicycle.	1 ____
	b)	The girl is sitting on a chair.	2 ____
ITEM 2.	a)	The boy is putting on his shoe.	1 ____
	b)	The girl is drinking from a cup.	2 ____
ITEM 3.	a)	The boy runs	1 ____
	b)	and falls down	2 ____
	c)	and hurts his leg.	3 ____
ITEM 4.	a)	The girl goes to the park	1 ____
	b)	and throws a ball	2 ____
	c)	and chases it.	3 ____
ITEM 5.	a)	The mother is walking with the boy on the street.	1 ____
	b)	They go into a store.	2 ____
	c)	The boy buys an apple.	3 ____
	d)	The boy gives the apple to another boy.	4 ____
ITEM 6.	a)	The father and the girl are walking in the park.	1 ____
	b)	They go over to a swing set.	2 ____
	c)	The father puts the girl on the swing.	3 ____
	d)	The father pushes it and the girl goes up in the air.	4 ____
ITEM 7.	a)	The farmer is planting corn by hand.	1 ____
	b)	The farmer is driving a tractor in the cornfield.	2 ____
	c)	The farmer is driving to market in a truck full of corn.	3 ____
	d)	The farmer sells the corn to another man.	4 ____
	e)	The farmer drives home in an empty truck.	5 ____
ITEM 8.	a)	The woman is driving a car.	1 ____
	b)	The car has a flat tire.	2 ____
	c)	The woman gets out the jack.	3 ____
	d)	The woman puts on another tire.	4 ____
	e)	The woman drives off in the car.	5 ____

TOTAL ____

Pictures for Memory for Sentences Task

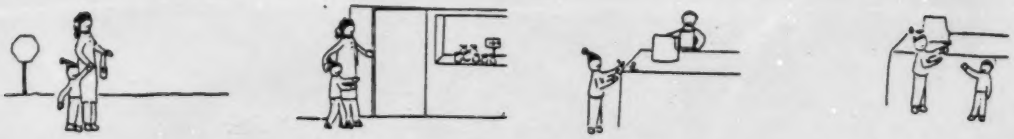
Item 1

Item 2

Item 3

Item 4

Item 5



Item 6

Item 7

Item 8

COGNITIVE ASSESSMENT SESSION REPORT

Child ID#_____

Examiner Session 1_____ Session 2_____

I. Describe child's WPPSI performance. Note any interesting or unusual family/environmental circumstances

Was there a discrepancy score?_____ (If yes, include verbal and performance figures)

_____

II. What is your overall impression of the child's performance? (Describe general cooperativeness, affect, ability to concentrate and grasp task, etc.)

Session 1 Session 2

III. Describe any unusual behaviors/problems exhibited by child.

Session 1 Session 2

IV. Describe child's predominant strategy used <u>across tasks</u> to solve problems, if any.

Session 1 Session 2

V. Record (by task) anything peculiar to that assessment.

A. Teddy Bear Task

1. Did child learn to use buttons appropriately?

Session 1 Session 2

COGNITIVE ASSESSMENT SESSION REPORT (Cont'd)

V. (Cont'd)

2. Did child learn same/different without major problems?

Session 1 Session 2

B. MAST

1. Did child verbally encode? (Specify which sections, if any: VP, VH, HP, HH)

Session 1 Session 2

C. Seriation

D. Memory for Sentences

E. Turtles

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Dean, A. L., & Harvey, W. O. An information-processing analysis of a Piagetian imagery task. Developmental Psychology, 1979, 15, 474-475.

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APPENDIX B

TABLES OF MEANS AND STANDARD DEVIATIONS FROM WPPSI VERBAL IQ ANALYSES AND BIRTHORDER ANALYSES

TABLE 30

MEANS AND STANDARD DEVIATIONS (SD) FROM IQ ANALYSES ON COMMUNICATION VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ
	N=30	N=30	N=30	N=30	N=30	N=30	N=30	N=30
STRATEGIES:								
DISTANCING	6.07 (5.35)	6.77 (5.93)	5.83 (5.13)	6.53 (4.73)	6.67 (6.21)	7.77 (5.35)	5.23 (4.34)	7.10 (6.72)
RATIONAL AUTHORITATIVE	8.33 (3.47)	7.17 (4.91)	8.83 (4.40)	8.37 (4.34)	9.13 (5.11)	7.70 (4.33)	10.37 (4.27)	8.50 (4.95)
GOALS:								
COGNITIVE	22.50 (6.30)	21.13 (5.59)	21.07 (5.94)	22.17 (6.52)	22.73 (5.93)	22.00 (5.04)	22.07 (6.44)	22.37 (5.89)
PERSONAL-SOCIAL	12.13 (5.48)	10.47 (4.64)	12.37 (5.36)	12.67 (6.03)	13.53 (4.66)	12.17 (4.28)	11.53 (3.93)	12.70 (5.24)
MANAGEMENT	12.73 (4.62)	12.50 (5.43)	12.47 (5.62)	12.63 (5.05)	13.23 (3.95)	11.57 (4.85)	12.07 (5.05)	11.93 (5.66)
ORIENTATIONS:								
PARENT ROLE	42.60 (12.32)	42.90 (16.12)	41.43 (13.61)	38.53 (10.78)	40.10 (15.89)	38.17 (15.12)	41.87 (14.67)	39.73 (12.42)
CHILD	35.80 (11.74)	36.73 (13.19)	36.43 (12.39)	40.83 (10.46)	43.43 (11.81)	43.50 (12.42)	38.90 (11.79)	40.00 (15.11)
CONSTRAINTS:								
CHILD	6.50 (3.46)	5.10 (3.68)	6.40 (4.59)	5.53 (4.52)	3.90 (3.43)	6.63 (5.16)	5.13 (3.14)	5.00 (3.52)

TABLE 31

MEANS AND STANDARD DEVIATIONS (SD) FROM IQ ANALYSES
ON CONSTRUCTION VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	LOW IQ N=30	HIGH IQ N=30	LOW IQ N=30	HIGH IQ N=30	LOW IQ N=30	HIGH IQ N=30	LOW IQ N=30	HIGH IQ N=30
ACCUMULATION	5.70 (4.54)	4.63 (3.00)	6.00 (4.38)	4.43 (3.14)	5.17 (2.93)	5.43 (3.03)	3.90 (3.01)	5.57 (3.07)
COGNITIVE PROCESSES	3.20 (2.12)	4.10 (3.02)	4.50 (3.75)	4.30 (3.03)	3.70 (3.32)	4.63 (2.85)	4.23 (3.49)	4.33 (3.40)
DIRECT INSTRUCTION	15.53 (6.42)	14.10 (5.16)	15.93 (6.37)	13.73 (6.33)	14.07 (5.78)	15.57 (6.06)	15.57 (5.45)	15.07 (5.67)
EXPERIMENTATION	4.07 (2.90)	3.87 (3.27)	3.87 (3.04)	4.37 (2.93)	5.20 (3.02)	4.50 (3.20)	3.93 (3.14)	4.93 (3.32)
EXPOSURE	11.43 (3.58)	11.27 (3.86)	11.27 (3.98)	13.37 (3.64)	12.33 (3.70)	11.10 (3.27)	10.67 (4.25)	13.17 (4.68)
MANIPULATE ENVIRONMENT	5.83 (3.15)	5.33 (3.03)	5.77 (3.26)	5.43 (3.37)	6.17 (2.98)	4.70 (2.95)	5.10 (3.65)	5.30 (2.63)
NEGATIVE FEEDBACK	5.07 (2.83)	4.63 (3.70)	5.13 (2.42)	5.17 (2.74)	3.77 (2.92)	3.07 (2.10)	4.67 (3.20)	3.43 (2.91)
POSITIVE FEEDBACK	5.73 (2.70)	5.20 (2.66)	5.27 (2.99)	5.17 (3.36)	5.50 (3.15)	5.07 (3.78)	5.17 (2.72)	4.40 (3.69)
SELF REGULATION	4.17 (3.12)	3.97 (2.63)	4.10 (3.44)	3.37 (2.76)	4.13 (3.32)	4.77 (2.97)	4.07 (2.55)	3.87 (2.49)
ACTIVE-PASSIVE SUM	32.83 (7.37)	33.80 (5.79)	34.77 (7.28)	35.00 (6.45)	35.97 (6.26)	37.17 (7.01)	35.47 (7.49)	35.87 (6.37)
CONFIDENCE RATING	3.00 (0.79)	2.47 (1.11)	2.67 (1.06)	2.53 (1.07)	2.90 (0.99)	2.73 (1.01)	2.60 (0.97)	3.00 (0.74)

TABLE 32

MEANS AND STANDARD DEVIATIONS (SD) FROM IQ ANALYSES ON PARENT BEHAVIOR VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ
	N=30	N=30	N=30	N=30	N=30	N=30	N=30	N=30
FORM: STATEMENTS								
PAPER	25.53	24.63	23.10	26.23	26.30	24.07	26.87	24.80
	(9.20)	(7.42)	(8.86)	(7.44)	(8.04)	(8.21)	(8.87)	(9.12)
STORY	19.17	18.60	19.67	20.33	19.47	16.47	20.40	18.43
	(7.79)	(10.08)	(8.70)	(8.27)	(7.23)	(7.84)	(8.20)	(7.44)
QUESTIONS								
PAPER	23.60	26.10	22.03	23.93	24.93	23.97	25.87	24.63
	(9.50)	(11.06)	(12.07)	(9.09)	(9.87)	(8.88)	(9.07)	(9.97)
STORY	28.80	28.53	29.83	27.53	25.93	24.40	29.17	24.87
	(11.64)	(10.04)	(7.99)	(12.36)	(7.07)	(7.82)	(11.26)	(9.34)
IMPERATIVES								
PAPER	34.63	25.43	38.07	30.53	24.90	23.13	29.07	27.77
	(16.06)	(13.43)	(17.71)	(10.56)	(16.70)	(12.69)	(13.83)	(12.12)
MOD: HIGH								
PAPER	17.40	21.23	17.20	18.53	19.60	18.00	20.63	19.40
	(8.14)	(8.31)	(8.50)	(8.98)	(7.43)	(5.63)	(6.10)	(7.84)
STORY	15.33	18.57	14.83	18.43	18.47	17.57	19.70	17.97
	(7.62)	(7.62)	(7.42)	(7.61)	(6.28)	(6.70)	(7.24)	(8.98)
MEDIUM								
PAPER	6.47	7.90	6.90	8.33	8.97	8.00	8.50	9.17
	(4.90)	(3.67)	(4.39)	(2.92)	(3.83)	(3.46)	(5.56)	(5.44)
STORY	3.83	3.03	3.03	3.40	3.83	2.63	3.73	3.43
	(2.94)	(2.22)	(2.62)	(2.61)	(2.59)	(2.31)	(2.94)	(2.36)
LOW								
PAPER	22.53	18.33	20.00	18.70	18.43	17.13	17.43	17.57
	(8.90)	(8.05)	(8.98)	(9.16)	(7.30)	(5.80)	(7.02)	(7.31)
STORY	36.60	25.77	37.83	28.27	24.73	19.83	27.67	21.27
	(15.97)	(10.10)	(16.30)	(12.36)	(8.04)	(7.61)	(12.64)	(6.47)
PARENT READS								
STORY	11.33	10.33	9.20	10.70	10.17	11.00	10.47	11.37
	(6.02)	(4.24)	(4.74)	(4.42)	(3.55)	(4.28)	(4.45)	(3.11)
STRUCTURING: VERBAL TASK								
PAPER	34.90	29.33	37.93	35.43	29.93	28.23	35.30	31.00
	(11.13)	(12.21)	(13.15)	(11.24)	(15.98)	(14.50)	(15.59)	(11.74)
NONVERBAL								
PAPER	17.57	15.77	15.30	15.23	15.07	12.50	14.93	14.00
	(9.35)	(8.52)	(8.79)	(9.67)	(8.79)	(8.21)	(7.04)	(8.75)
STORY	23.40	13.80	20.60	17.40	14.90	11.53	22.90	14.03
	(18.05)	(10.64)	(12.17)	(13.26)	(11.00)	(10.20)	(18.33)	(13.17)
SUPPORT: APPROVAL								
PAPER	12.93	18.17	13.33	18.23	17.93	16.43	18.60	17.23
	(6.86)	(4.93)	(7.95)	(7.47)	(5.10)	(5.99)	(5.62)	(5.45)
STORY	10.30	10.47	9.20	10.23	10.87	8.20	11.83	8.70
	(5.88)	(4.13)	(5.97)	(4.92)	(4.81)	(4.13)	(4.89)	(4.44)
ATTENTION GETTING								
PAPER	41.63	31.20	41.23	35.73	32.80	31.03	36.67	30.87
	(14.67)	(10.77)	(15.22)	(10.20)	(12.23)	(10.86)	(12.87)	(11.25)
STORY	28.27	15.17	27.13	17.10	17.43	14.17	19.20	15.30
	(15.12)	(6.63)	(15.94)	(7.75)	(9.53)	(9.99)	(11.84)	(7.33)
NONVERBAL (intrusions)								
PAPER	24.50	16.23	21.20	20.37	17.53	14.10	19.00	18.53
	(19.88)	(15.14)	(9.95)	(17.29)	(11.60)	(10.95)	(11.24)	(14.86)

TABLE 32 (CONT'D)

MEANS AND STANDARD DEVIATIONS (SD) FROM IQ ANALYSES
ON PARENT BEHAVIOR VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ	LOW IQ	HIGH IQ
	N=30	N=30	N=30	N=30	N=30	N=30	N=30	N=30
CHILD ENGAGEMENT: ACTIVE								
PAPER	56.47	62.17	58.20	65.50	61.73	59.97	63.70	67.63
	(17.18)	(15.38)	(20.13)	(11.73)	(13.31)	(13.36)	(10.58)	(16.43)
STORY	42.50	41.70	40.57	40.83	39.70	36.37	41.63	39.57
	(14.16)	(13.29)	(18.57)	(10.04)	(8.54)	(8.47)	(11.43)	(14.17)
PASSIVE								
PAPER	15.63	15.37	14.70	16.10	16.53	13.57	17.57	13.40
	(7.61)	(6.91)	(7.19)	(8.45)	(7.56)	(6.99)	(9.13)	(7.97)
STORY	21.60	21.57	22.33	24.63	22.67	19.93	23.60	21.93
	(8.05)	(9.54)	(10.33)	(10.61)	(7.59)	(9.31)	(8.77)	(7.79)
SUM OF RATINGS OF CHILD PERFORM								
PAPER	7.57	12.80	7.07	11.73	12.07	14.20	10.60	12.80
	(4.37)	(4.05)	(5.12)	(4.23)	(4.72)	(3.86)	(4.65)	(4.57)
PROPORTION SCORE OF RATINGS								
PAPER	5.40	5.70	5.07	5.37	5.63	5.90	5.57	5.43
	(0.81)	(0.70)	(1.66)	(1.25)	(0.76)	(0.40)	(0.82)	(1.14)
READING BY PARENT IN SECONDS								
STORY	63.63	79.73	58.60	76.57	79.40	97.67	74.57	89.33
	(26.37)	(26.10)	(36.42)	(27.71)	(24.36)	(23.41)	(34.55)	(23.85)
INTERACTION LENGTH:								
TOTAL TIME IN SECONDS								
PAPER	373.97	332.10	377.20	330.60	310.67	309.07	338.80	331.87
	(168.21)	(98.00)	(139.53)	(50.39)	(32.08)	(37.92)	(83.32)	(72.03)
STORY	371.83	357.53	422.03	376.67	346.57	319.87	387.17	323.20
	(121.96)	(97.36)	(192.49)	(113.64)	(71.82)	(51.64)	(125.97)	(44.91)
TASK TIME								
PAPER	321.73	251.40	318.73	264.97	241.67	221.83	277.50	243.83
	(200.63)	(135.90)	(183.67)	(104.41)	(83.62)	(86.80)	(126.72)	(125.65)
STORY	348.03	322.97	410.63	344.67	315.00	279.73	364.53	295.57
	(141.50)	(128.32)	(201.24)	(143.47)	(100.58)	(84.32)	(144.84)	(70.98)
NUMBER OF INTERACTIONS								
PAPER	91.73	86.80	89.13	90.70	86.13	80.83	90.97	87.23
	(19.42)	(16.81)	(19.29)	(18.02)	(16.69)	(21.02)	(17.42)	(18.20)
STORY	81.37	68.23	77.73	70.83	69.00	62.30	71.73	66.00
	(18.50)	(19.23)	(18.89)	(18.94)	(12.02)	(16.95)	(19.25)	(15.47)
PARENT: WARMTH								
PAPER	2.17	2.33	1.80	1.87	2.20	2.17	2.03	2.10
	(0.59)	(0.66)	(0.76)	(0.57)	(0.61)	(0.59)	(0.56)	(0.80)
STORY	2.17	2.20	1.90	1.97	2.23	2.13	2.03	2.07
	(0.65)	(0.55)	(0.76)	(0.72)	(0.63)	(0.68)	(0.61)	(0.78)
SENSITIVITY								
PAPER	1.80	2.13	1.63	1.77	2.20	2.17	1.97	2.10
	(0.81)	(0.63)	(0.81)	(0.57)	(0.61)	(0.59)	(0.61)	(0.76)
STORY	2.17	2.23	1.87	1.97	2.30	2.37	2.17	2.13
	(0.65)	(0.50)	(0.73)	(0.61)	(0.53)	(0.72)	(0.65)	(0.73)

TABLE 33

MEANS AND STANDARD DEVIATIONS (SD) FROM BIRTHORDER ANALYSES ON COMMUNICATION VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	FIRST BORN N=22	LATER BORN N=38	FIRST BORN N=22	LATER BORN N=38	FIRST BORN N=24	LATER BORN N=36	FIRST BORN N=24	LATER BORN N=36
STRATEGIES:								
DISTANCING	5.09 (5.00)	7.18 (5.86)	5.64 (4.89)	6.50 (4.94)	6.42 (5.11)	7.75 (6.19)	5.58 (5.92)	6.56 (5.58)
RATIONAL AUTHORITATIVE	8.73 (4.54)	7.18 (4.03)	9.23 (4.06)	8.24 (4.50)	9.63 (4.89)	7.61 (4.55)	9.33 (4.51)	9.50 (4.86)
GOALS:								
COGNITIVE	21.68 (5.47)	21.89 (6.27)	20.82 (6.90)	22.08 (5.82)	23.29 (6.29)	21.75 (4.84)	20.92 (5.98)	23.08 (6.14)
PERSONAL-SOCIAL	11.64 (5.99)	11.11 (4.59)	13.05 (5.42)	12.21 (5.84)	11.08 (4.05)	14.03 (4.43)	13.42 (6.18)	11.25 (3.02)
MANAGEMENT	13.18 (5.43)	12.29 (4.78)	13.82 (5.87)	11.82 (4.87)	12.50 (4.80)	12.33 (4.29)	11.88 (5.64)	12.58 (5.17)
ORIENTATIONS:								
PARENT ROLE	43.68 (13.44)	42.21 (14.81)	41.86 (12.26)	38.89 (12.29)	37.42 (15.58)	40.28 (15.40)	40.88 (12.78)	40.75 (14.16)
CHILD	37.82 (12.38)	35.37 (12.46)	38.95 (9.45)	38.45 (12.77)	43.13 (12.47)	43.69 (11.88)	39.58 (12.51)	39.36 (14.21)
CONSTRAINTS:								
CHILD	6.18 (3.53)	5.58 (3.69)	5.68 (5.18)	6.13 (4.19)	5.33 (5.05)	5.22 (4.27)	5.21 (2.62)	4.97 (3.73)

TABLE 34

MEANS AND STANDARD DEVIATIONS (SD) FROM BIRTHORDER ANALYSES ON CONSTRUCTION VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	FIRST BORN N=22	LATER BORN N=38	FIRST BORN N=22	LATER BORN N=38	FIRST BORN N=24	LATER BORN N=36	FIRST BORN N=24	LATER BORN N=36
ACCUMULATION	5.82 (4.55)	4.79 (3.39)	5.41 (4.62)	5.11 (3.41)	5.21 (3.28)	5.36 (2.81)	4.29 (3.01)	5.03 (3.21)
COGNITIVE PROCESSES	3.23 (2.25)	3.89 (2.83)	4.77 (3.66)	4.18 (3.24)	4.33 (3.29)	4.06 (3.01)	4.71 (3.67)	4.00 (3.26)
DIRECT INSTRUCTION	15.36 (6.57)	14.50 (5.40)	14.23 (5.94)	15.18 (6.69)	15.83 (6.73)	14.14 (5.30)	14.58 (6.12)	15.81 (5.11)
EXPERIMENTATION	4.05 (3.77)	3.92 (2.62)	4.64 (3.61)	3.82 (2.53)	4.38 (2.90)	5.17 (3.24)	4.25 (3.50)	4.56 (3.10)
EXPOSURE	11.68 (3.87)	11.16 (3.62)	12.18 (4.49)	12.39 (3.63)	10.50 (3.72)	12.53 (3.18)	11.83 (4.95)	11.97 (4.61)
MANIPULATE ENVIRONMENT	5.82 (3.28)	5.45 (2.99)	4.73 (2.55)	6.11 (3.59)	4.88 (2.67)	5.81 (3.06)	4.25 (2.94)	5.83 (3.18)
NEGATIVE FEEDBACK	4.73 (3.37)	4.92 (3.26)	5.36 (2.87)	5.03 (2.40)	3.83 (2.68)	3.14 (2.45)	3.46 (2.72)	4.44 (3.30)
POSITIVE FEEDBACK	5.14 (2.71)	5.66 (2.66)	5.59 (3.13)	5.00 (3.20)	4.46 (3.15)	5.83 (3.58)	4.83 (2.84)	4.75 (3.52)
SELF REGULATION	4.36 (3.23)	3.89 (2.66)	3.82 (3.05)	3.68 (3.19)	4.58 (3.19)	4.36 (3.15)	4.08 (2.50)	3.89 (2.53)
ACTIVE-PASSIVE SUM	33.23 (7.44)	33.37 (6.14)	35.27 (7.52)	34.66 (6.48)	35.88 (5.97)	37.03 (7.06)	36.25 (8.43)	35.28 (5.75)
CONFIDENCE RATING	2.59 (1.14)	2.82 (0.90)	2.55 (1.06)	2.63 (1.08)	2.71 (1.16)	2.89 (0.89)	2.63 (0.82)	2.92 (0.91)

TABLE 35

MEANS AND STANDARD DEVIATIONS (SD) FROM BIRTHORDER ANALYSES ON PARENT BEHAVIOR VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	FIRST BORN (N=22)	LATER BORN (N=38)	FIRST BORN (N=22)	LATER BORN (N=38)	FIRST BORN (N=24)	LATER BORN (N=36)	FIRST BORN (N=24)	LATER BORN (N=36)
FORM: STATEMENTS								
PAPER	25.32	24.95	22.59	25.87	25.33	25.08	26.54	25.36
	(8.90)	(8.05)	(7.87)	(8.35)	(7.84)	(8.43)	(8.55)	(9.35)
STORY	21.18	17.55	19.05	20.55	18.83	17.39	21.38	18.11
	(11.50)	(6.88)	(9.02)	(8.13)	(8.68)	(6.91)	(8.86)	(6.88)
QUESTIONS								
PAPER	25.27	24.61	18.36	25.66	22.71	25.61	21.50	27.75
	(11.29)	(9.83)	(8.58)	(10.89)	(7.93)	(10.08)	(8.83)	(9.16)
STORY	30.82	27.42	28.86	28.58	24.46	25.64	25.58	27.97
	(9.34)	(11.47)	(11.63)	(9.76)	(4.74)	(7.91)	(11.81)	(9.55)
IMPERATIVES								
PAPER	31.86	28.97	39.73	31.16	26.46	22.39	30.33	27.14
	(13.42)	(16.50)	(18.13)	(11.91)	(16.50)	(13.43)	(14.25)	(11.97)
MOD: HIGH								
PAPER	19.86	19.00	15.41	19.29	18.08	19.28	17.58	21.64
	(8.11)	(8.62)	(6.78)	(9.42)	(5.53)	(7.23)	(7.07)	(6.54)
STORY	16.50	17.21	14.23	18.03	15.67	19.58	19.13	18.64
	(9.11)	(6.92)	(6.30)	(8.11)	(4.40)	(7.16)	(10.31)	(6.44)
MEDIUM								
PAPER	6.77	7.42	6.32	8.37	8.00	8.81	7.38	9.81
	(4.16)	(4.49)	(3.41)	(3.79)	(3.87)	(3.52)	(4.44)	(5.91)
STORY	3.41	3.45	2.64	3.55	3.29	3.19	3.79	3.44
	(2.86)	(2.50)	(1.79)	(2.94)	(2.74)	(2.38)	(2.62)	(2.69)
LOW								
PAPER	21.00	20.11	19.68	19.16	16.92	18.36	17.92	17.22
	(9.39)	(8.35)	(8.60)	(9.35)	(6.01)	(6.94)	(7.81)	(6.69)
STORY	39.55	26.34	36.68	30.95	24.50	20.81	24.46	24.47
	(14.85)	(11.69)	(17.88)	(13.08)	(7.62)	(8.25)	(10.72)	(10.45)
PARENT READS								
STORY	11.41	10.50	8.59	10.74	11.50	9.97	11.42	10.58
	(6.61)	(4.22)	(4.69)	(4.43)	(4.25)	(3.61)	(2.95)	(4.34)
STRUCTURING: VERBAL TASK								
PAPER	32.64	31.82	39.45	35.08	33.00	26.47	34.67	32.14
	(11.77)	(12.16)	(12.58)	(11.84)	(15.99)	(14.20)	(13.52)	(14.17)
NONVERBAL								
PAPER	16.73	16.63	16.95	14.29	14.13	13.56	14.17	14.67
	(8.92)	(9.03)	(8.88)	(9.29)	(10.75)	(6.82)	(8.94)	(7.23)
STORY	22.41	16.39	21.64	17.47	15.08	11.97	17.92	18.83
	(13.06)	(16.46)	(15.43)	(10.79)	(11.96)	(9.66)	(17.63)	(15.85)
SUPPORT: APPROVAL								
PAPER	15.45	15.61	15.82	15.76	18.33	16.42	18.58	17.47
	(7.25)	(6.11)	(8.34)	(7.97)	(4.74)	(5.99)	(6.50)	(4.83)
STORY	10.41	10.37	9.41	9.89	8.75	10.06	10.54	10.08
	(5.73)	(4.67)	(6.53)	(4.81)	(4.05)	(4.99)	(5.85)	(4.22)
ATTENTION GETTING								
PAPER	41.23	33.63	41.00	37.03	34.33	30.31	36.13	32.19
	(15.08)	(12.37)	(13.80)	(12.70)	(10.57)	(11.96)	(11.84)	(12.57)
STORY	25.82	19.34	24.23	20.89	14.58	16.61	19.88	15.50
	(15.91)	(11.13)	(13.72)	(13.26)	(6.69)	(11.46)	(11.59)	(8.42)
NONVERBAL (intrusions)								
PAPER	21.23	19.87	20.64	20.87	14.00	17.03	17.46	19.64
	(21.83)	(15.69)	(15.03)	(13.56)	(8.96)	(12.62)	(13.87)	(12.63)

TABLE 35 (CONT'D)

MEANS AND STANDARD DEVIATIONS (SD) FROM BIRTHORDER ANALYSES ON PARENT BEHAVIOR VARIABLES

	CH				NCH			
	MOTHERS OF		FATHERS OF		MOTHERS OF		FATHERS OF	
	FIRST BORN (N=22)	LATER BORN (N=38)	FIRST BORN (N=22)	LATER BORN (N=38)	FIRST BORN (N=24)	LATER BORN (N=36)	FIRST BORN (N=24)	LATER BORN (N=36)
CHILD ENGAGEMENT: ACTIVE								
PAPER	59.50	59.21	59.73	63.08	62.71	59.61	66.54	65.08
	(20.72)	(13.65)	(22.26)	(12.71)	(12.37)	(13.84)	(18.79)	(9.50)
STORY	47.91	38.74	40.05	41.08	38.63	37.64	41.29	40.14
	(16.62)	(10.36)	(20.78)	(10.19)	(7.49)	(9.34)	(14.67)	(11.60)
PASSIVE								
PAPER	14.32	16.18	13.73	16.37	16.29	14.22	13.75	15.81
	(6.98)	(7.34)	(7.74)	(7.79)	(8.46)	(6.54)	(8.14)	(9.37)
STORY	21.91	21.39	21.41	24.68	23.46	19.86	23.88	22.03
	(9.26)	(8.56)	(9.74)	(10.78)	(9.56)	(7.57)	(8.54)	(8.12)
SUM OF RATINGS OF CHILD PERFORM								
PAPER	10.36	10.08	8.23	10.08	13.96	12.58	11.92	11.56
	(5.55)	(4.62)	(5.95)	(4.69)	(4.31)	(4.45)	(4.86)	(4.66)
PROPORTION SCORE OF RATINGS								
PAPER	5.32	5.68	4.82	5.45	5.88	5.69	5.25	5.67
	(0.84)	(0.70)	(1.84)	(1.16)	(0.45)	(0.71)	(1.29)	(0.68)
READING BY PARENT IN SECONDS								
STORY	66.55	74.66	66.50	68.21	90.46	87.25	81.50	82.25
	(31.37)	(24.50)	(41.66)	(28.04)	(25.11)	(25.88)	(28.97)	(31.65)
INTERACTION LENGTH:								
TOTAL TIME IN SECONDS								
PAPER	385.95	333.97	378.23	339.82	309.62	310.03	353.25	323.39
	(164.99)	(118.09)	(138.55)	(81.73)	(44.54)	(27.23)	(107.46)	(46.01)
STORY	364.45	364.82	438.77	376.53	321.67	340.92	354.42	355.69
	(119.16)	(105.41)	(195.49)	(129.80)	(46.71)	(72.13)	(75.87)	(113.09)
TASK TIME								
PAPER	325.09	264.26	338.73	264.71	224.29	236.72	276.62	250.03
	(205.06)	(150.90)	(169.12)	(133.64)	(90.09)	(82.51)	(157.64)	(101.24)
STORY	335.77	335.34	421.50	352.26	283.12	306.86	339.29	323.89
	(144.08)	(130.66)	(212.07)	(149.36)	(78.82)	(102.43)	(91.73)	(134.04)
NUMBER OF INTERACTIONS								
PAPER	92.27	87.53	86.55	91.87	84.83	82.58	88.13	89.75
	(17.45)	(18.59)	(20.10)	(17.52)	(18.30)	(19.66)	(18.80)	(17.28)
STORY	83.18	69.95	73.32	74.84	66.63	65.00	70.33	67.89
	(18.47)	(19.20)	(23.22)	(16.53)	(13.55)	(15.97)	(19.17)	(16.60)
PARENT: WARMTH								
PAPER	2.09	2.34	1.86	1.82	2.04	2.28	2.08	2.06
	(0.61)	(0.63)	(0.71)	(0.65)	(0.55)	(0.61)	(0.65)	(0.71)
STORY	2.00	2.29	1.95	1.92	2.08	2.25	2.13	2.00
	(0.53)	(0.61)	(0.79)	(0.71)	(0.65)	(0.65)	(0.74)	(0.68)
SENSITIVITY								
PAPER	1.77	2.08	1.73	1.68	2.08	2.25	2.04	2.03
	(0.81)	(0.67)	(0.83)	(0.62)	(0.58)	(0.60)	(0.62)	(0.74)
STORY	2.14	2.24	1.95	1.89	2.25	2.39	2.25	2.08
	(0.56)	(0.59)	(0.65)	(0.69)	(0.53)	(0.69)	(0.74)	(0.65)

TABLE 36

MEANS AND STANDARD DEVIATIONS (SD) FROM BIRTHORDER ANALYSES ON COGNITIVE VARIABLES

	CH			NCH		
	FIRST BORN N=22	LATER BORN N=38	TOTAL N=60	FIRST BORN N=24	LATER BORN N=36	TOTAL N=60
ANTICIPATORY IMAGERY	8.09 (4.07)	7.92 (3.84)	7.98 (3.89)	9.58 (2.89)	9.92 (2.33)	9.78 (2.55)
SEQUENCING MEMORY:						
PICTURES	22.36 (15.31)	24.45 (13.09)	23.68 (13.85)	30.79 (11.95)	33.00 (13.50)	32.12 (12.84)
GEOMETRIC FORMS	16.86 (13.39)	16.61 (10.63)	16.70 (11.61)	23.25 (8.88)	22.36 (10.71)	22.72 (9.95)
SERIATION OF PICTURES	2.59 (1.82)	2.55 (2.23)	2.57 (2.07)	3.50 (1.47)	3.44 (1.92)	3.47 (1.74)
MEMORY OF SENTENCES	11.41 (8.02)	10.45 (7.34)	10.80 (7.55)	14.88 (6.13)	14.47 (6.83)	14.63 (6.51)
SIMON	1.50 (1.41)	1.82 (1.49)	1.70 (1.45)	3.04 (1.55)	2.28 (1.72)	2.58 (1.68)
WPPSI: VERBAL IQ	94.91 (26.61)	96.00 (19.71)	95.60 (22.27)	118.75 (14.70)	114.86 (13.42)	116.42 (13.96)
PERFORMANCE IQ	94.73 (25.98)	100.63 (24.21)	98.47 (24.82)	117.67 (12.35)	115.31 (17.07)	116.25 (15.28)
FULL IQ	94.36 (28.40)	98.18 (22.98)	96.78 (24.93)	120.17 (13.05)	116.56 (15.18)	118.00 (14.36)
TEDDY: SUM OF THE ARCSIN PROPORTION OF ERRORS			2.35 (1.29)			2.06 (1.16)